

II. On the *Pieridæ* of the Indian and Australian Regions.

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[Read 18th February, 1867.]

THE *Pieridæ* form a rather extensive group of diurnal *Lepidoptera* abundantly distributed over the whole world, and typically represented in our own country by the "cabbage," the "orange tip," the "brimstone" and the "wood white" butterflies. The white or yellow colour that characterizes these familiar insects is that which recurs most frequently throughout this group in every country; but in the tropics other forms appear by their side decorated with a variety of colours, and assuming to some extent the forms and markings of the more brilliant families of butterflies. It is to be observed, however, that in most cases the ground colour of the insect is either white, yellow or black, and even in those exceptional cases in which the wings are entirely red or bluish-grey, the female of the same species, or of one closely allied to it, presents us with the usual simple colours. The rich rufous-brown, which so constantly reappears throughout the great family of the *Nymphalidæ*, is not to be met with in a single instance in the whole range of the present family. The metallic blue of *Morpho* and of the *Lycænidæ*, and the rich green of various shades which occurs in most other groups of butterflies, are also entirely absent. Although the markings are often very beautiful and very varied, well formed ocellated spots (almost universal in the *Satyridæ* and very frequent in the *Nymphalidæ*) never once occur; the only approach to them being the small discoidal ocelli in some species. The form of the wings is generally rounded, rarely angular, and the hind wings are never adorned with spatulate, linear or filiform processes, such as occur frequently in most other groups of butterflies. The nearest approach to a tail in the whole family is found in the genus *Gonepteryx*, and is never much more developed than in our own brimstone butterfly.

It appears, then, that quite independently of structural characters, the *Pieridæ* possess specialities of colour, of marking, and of form of wing, which in their combination mark them out as a natural and somewhat isolated group; and strikingly illustrate the stability of type that sometimes obtains in what we usually deem unimportant and very variable characters. At the same time it is to be noted that in the important structural character of the neuration of the wings, few families exhibit so many modifications. This character serves chiefly to break up the group into three-

and-twenty genera, combined with the form of the antennæ, palpi and anal valves, all of which vary perhaps more than is usual. The form and texture of the wings also seem very subject to modification within certain limits, as is well seen by comparing the delicate elongate forms of *Leptalis* and *Leucophasia* with the strong and compact *Callidryas* and *Colias*; and in colouration no contrast can be greater than that between such genera as *Euterpe* and *Gonepteryx*. Perhaps too there is no family more generally and uniformly distributed over the whole earth. *Pieridæ* inhabit the deserts of Arabia as well as the tropical forests; they sport about the snows of the Himalayas and roam over the icy plains of Siberia. The variety of conditions to which they are subject is therefore as great as can well be conceived, and the considerable generic diversity that exists among them probably indicates a great antiquity for the group, yet the ever fluctuating characters of colour, form and marking have nevertheless their strict limits which they in no case overpass.

The large amount of diversity in the neurulation of the wings of the *Pieridæ*, together with the considerable differences in the form of the antennæ and palpi, have led to the establishment of a number of well-marked generic groups. In the "Genera of Diurnal Lepidoptera," published about the year 1847, Mr. Doubleday admitted sixteen genera of *Pieridæ*. Since that time five have been added, most of which were indicated and even named by him as distinct sections of genera. In the present paper I add two, formed out of the old genus *Pieris*, thus raising the total number of genera to twenty-three. These are distributed with tolerable equality through the great zoological divisions of the earth; the South American and Australian regions each having eleven, the African region ten, the varied Indian region (including the western Malay Islands) fifteen, while the Nearctic and Palæarctic regions each possess six genera.

The extreme isolation of the South American continent from the other tropical regions is indicated by its possessing three peculiar genera,—*Euterpe*, *Leptalis* and *Hesperocharis*,—while the Indian region has but two, *Prioneris* and *Dercas*, and the Australian and Palæarctic but one each, *Elodina* and *Leucophasia* respectively. The Nearctic and the Ethiopian regions have no peculiar genera. Only a single genus is universally distributed over the globe, the true *Pieris*. This has representatives both in the polar and the equatorial regions, on the highest mountains and over the hottest plains. *Callidryas*, *Terias* and *Tachyris* are tropical groups which range round the equatorial regions of

the earth, but never extend far northward of the tropics. *Colias* and *Anthocharis* on the other hand are Arctic and Alpine, occurring in both continents and in both hemispheres, but rarely extending into tropical lowlands. In most of these widely distributed genera the species also have a wide range, and some specific forms of *Callidryas*, *Tachyris* and *Terias* are almost identically reproduced in the eastern and western tropics. Most of these are insects which roam about cultivated grounds and river banks, and collect in swarms on wet and muddy shores; while the more restricted species and genera, such as *Euterpe*, *Leptalis*, *Leucophasia*, *Elodina*, *Thyca* and *Eronia*, are inhabitants of woods and forests, and become quickly exterminated by the advance of cultivation.

The following table exhibits the distribution of the genera of *Pieridæ* throughout the six zoological divisions of the earth, with the number of species of each described up to this time.

DISTRIBUTION OF PIERIDÆ.

Total Species.			Neo-tropical.	Ne-arctic	Palæ-arctic.	Ethiopian.	Indian.	Aus-tralian.
50	EUTERPE	50	—	—	—	—	—	—
63	LEPTALIS	63	—	—	—	—	—	—
3	LEUCOPHASIA ..	—	—	3	—	—	—	—
11	HESPEROCHARIS ..	11	—	—	—	—	—	—
8	PONTIA	—	—	—	2	3	4	—
8	ELODINA	—	—	—	—	—	—	8
120	TERIAS	76	4	—	8	19	21	—
165	PIERIS	51	11	14	41	31	23	—
57	THYCA	—	—	—	—	25	30	—
64	TACHYRIS	5	—	—	3	27	31	—
9	PRIONERIS	—	—	—	—	9	—	—
16	ERONIA	—	—	—	7	6	4	—
3	ZEGRIS	—	—	3	—	—	—	—
20	ANTHOCHARIS ..	1	6	13	—	—	—	—
3	NATHALIS	2	1	—	—	—	—	—
46	CALLOSUNE	—	—	—	44	3	—	—
44	COLIAS	8	12	24	2	4	1	—
11	IDMAIS	—	—	—	10	5	—	—
12	THIESTIAS	—	—	—	1	11	2	—
6	IPHIAS	—	—	—	—	3	4	—
3	DERCAS	—	—	—	—	3	—	—
11	GONEPTERYX ..	7	—	4	—	1	—	—
27	CALLIDRYAS ..	14	1	—	3	7	9	—
760	Species	288	35	61	121	157	137	—
	Genera	11	6	6	10	15	11	—
	Peculiar genera ..	3	0	1	0	2	1	—

By a consideration of the facts presented by the distribution of Birds and Mammals, it has been proved that the Malay Archipelago really belongs to two primary zoological divisions of the earth. A line drawn on the east side of the Philippines, curving to the west of Celebes, and passing between the islands of Baly and Lombock, will divide the Indian from the Australian region. Mr. Pascoe however is of opinion that this division will not hold good for insects, as he finds that in *Coleoptera*, and especially in *Longicornia*, New Guinea and the Moluccas have a much greater resemblance to Borneo and Malacca than they have to Australia. If this statement expressed the whole of the facts of the distribution of these insects, it would undoubtedly tend to prove that no very general causes have determined the distribution of organic life, and that we could therefore not hope to mark out such zoological regions of the earth as would be alike useful to the students of every branch of natural history. But I believe that along with this general resemblance of the *Coleoptera* from the two extremities of the Archipelago, there is also a diversity that points to the same division that is so strikingly manifested in the distribution of the higher animals. As examples I may mention the great and interesting Longicorn sub-family of *Tmesisternitæ* confined to the Australian region, although, owing to unfavourable conditions, almost absent from Australia itself. *Cyphogastra*, which Deyrolle considers one of the best marked genera of the family of *Buprestidæ*, and *Eupholus* among the *Curculionidæ*, are similarly restricted; while the metallic *Elateridæ* (*Campsosternus*), the giant *Buprestidæ* of the genus *Catoxantha*, and the splendid phytophagous *Sagræ*, are bounded in the western half of the Archipelago by the line above indicated. Such cases as these (and I feel sure they are much more numerous than is yet believed) would show that even the distribution of the *Coleoptera* is largely influenced by the same general causes which have more powerfully affected other groups; and I believe the cause of the anomaly presented by this order is to be found in the fact, that, in the grand and luxuriant forests which cover the whole Archipelago, almost all the *Coleoptera* are more or less intimately associated with dry or decaying timber. The larvæ of all the most prominent groups are lignivorous, and even the *Carabidæ* mostly dwell under dry or rotten bark. This circumstance is evidently in the highest degree favourable to the diffusion and intermingling of the productions of the different islands, and as the general physical

conditions are almost identical throughout, it is not surprising that an original diversity should have been reduced to an approximate uniformity of type in the two regions.

If this is the true explanation of the phenomenon, we ought to find the distinction of the two regions more marked in those orders and families where there is less probability of involuntary diffusion. The butterflies are almost entirely free from the chance of being carried from island to island by floating timber, but they are at all times subject to be blown great distances by storms and by the strong and changing monsoons. This last cause of diffusion is perhaps quite as powerful as the former one, but it is probable that these insects are not able to establish themselves in new countries with so much certainty as the *Colcoptera*, (as might be expected from the dependence of many of the species on particular plants, which they might not find in the place to which they were carried); for we find many instances in which genera and sections of genera are strictly limited to one-half of the Archipelago or the other. For example, the genera *Mynes* and *Hypocista* are confined strictly to the Australian region, and *Drusilla* is only represented out of that region by one species in Java. To this region also belong the genus *Elodina*, the *Erectheus* and *Priamus* groups of *Papilio*, the *Rachul* group of *Pieris*, the *Celestina* group of *Tachyris*, and the *Mysis* and *Philyra* group of *Thyca*. On the other hand, *Prioneris*, *Dercas* and *Thaumantis* range over the whole Indian region, but do not cross the dividing line; while *Thestias*, the *Coronis* group of *Pieris*, and the genera *Euripus*, *Clerome*, *Amathusia*, *Zcuxidia* and *Discophora*, only pass over the boundary into Celebes, or along the closely linked chain of islands east of Java to Timor. In most of these cases, the same groups that inhabit the Moluccas and New Guinea are found also in Australia, and in some of the islands of the Pacific; while, notwithstanding the similarity of physical conditions, and the narrowness of the dividing seas, they do not pass into Java, Borneo, or the other western islands. These facts go to prove, that notwithstanding the causes favourable to migration and intermixture in the case of insects, yet the isolation of groups dependent on ancient and permanent features in the physical geography of the country may still be very clearly traced; and if so, the primary zoological divisions of the earth, founded on the facts of distribution presented by the higher animals, will be found equally applicable to the objects of the Entomologist's study, since it will enable him

to account for the phenomena of distribution as he finds them to exist.

Zoological divisions of the earth's surface can only be true and useful ones, in so far as they agree with the most ancient and permanent natural barriers to the diffusion of species. Those divisions marked out by diversity of physical character or of climate are less important, because they are necessarily less defined, less general in their effects, and have most likely fluctuated much during short geological epochs. From some points of view the productions of the pampas of Buenos Ayres may differ more from those of the Brazilian forests than do these latter from those of the forests of tropical Africa, yet all will admit that the latter is a primary, while the former is a secondary zoological division. However large the number of groups which can be adduced as common to the equatoreal regions of Africa and America, but which do not extend to the open plains of temperate South America, we should none of us admit the propriety of forming for those groups a new division of the earth, in which the tropics of America and Africa should form a single region. All we can do is to endeavour to account for the anomaly, and try to discover what special causes have affected the distribution of these particular groups in a manner very different from that of almost all the other productions of nature. The case we are considering is one almost exactly analogous to this. The distribution of mammals, of birds, of reptiles, and many facts in the distribution of insects, clearly indicate that the mass of land forming Australia is but a portion of one of the primary zoological divisions of the globe, although in it some of the peculiarities of that division reach their maximum, while others are better exhibited in New Guinea and the Moluccas. The peculiar climate and physical condition of Australia, however, have led to the development of many groups peculiar to it, while the same causes have prevented others from becoming established in it, which have spread rapidly in the damp wooded tropical islands to the north. This localization of forms is carried to a greater extent in insects than in any of the higher animals; and so many extensive and remarkable groups abound in Australia, and are to be seen in every collection from that country and from no other, that the Entomologist may easily be led to ignore the equally striking facts that unite it to the surrounding islands by a strong band of zoological affinity.

The numerical proportion of species in islands and groups of

islands offers some interesting results agreeing with those which have been already obtained for the *Papilionidæ*. Of any single island Java takes the lead in the number of species of *Pieridæ* (35), which is probably owing to its having been more explored than Sumatra or Borneo. Next comes Celebes with 30 species, and further east Ceram with 24 species offers the greatest number, while Timor has but 18. Java and Timor may be considered the islands in the west and east which have the most speciality, and the island of Waigiu, near New Guinea, is another which may be taken as offering a good type of the characteristics of the Papuan fauna; yet these are all surpassed in speciality by Celebes, which is situated between them, as shown by the following statement :—

Species of <i>Pieridæ</i> .		Peculiar Species.	
Java....	35	....	13
Timor ..	18	....	7
Waigiu	11	....	2
Celebes	30	....	19

We thus are led to consider the island of Celebes, with one or two small islands adjacent to it, as forming a group equivalent to the much larger groups, which are well characterized by their peculiar faunas, thus :—

Groups of Islands.			Species of <i>Pieridæ</i> .	Peculiar Species.	Percentage of peculiar Species.
Indo-Malayan	..	..	57	38	66
Philippines	..	..	32	19	59
Celebes	..	..	30	19	63
Moluccas	..	..	46	28	61
Timorese	..	..	26	11	42
Papuan	..	..	28	20	71

When we consider the very limited area of Celebes, and the position in which it stands, closely surrounded on every side by the other groups, and therefore liable to be colonized from some of them by every ocean current and by every wind that blows, the amount of peculiarity here exhibited is certainly very remarkable, and indicates that its present insular condition dates from a very distant period. This is equally indicated by another class of facts of a more singular nature.

In my paper on the eastern *Papilionidæ* (Trans. Linn. Soc. xxv. 1) I called attention to the curious form of wing that characterizes most of the species of the island of Celebes. In the *Pieridæ* it is almost equally prominent, as may be seen by comparing the following species, nine in number, with the most nearly allied forms from the adjacent districts:—

<i>Pieris eperia</i> ,	as compared with	<i>P. coronis</i> .
<i>Thyca zebuda</i> ,	„ „	<i>T. Descombesi</i> .
<i>Thyca Rosenberghii</i> ,	„ „	<i>T. hyparete</i> .
<i>Tachyris Hombronii</i> ,	„ „	<i>T. lyncida</i> .
<i>Tachyris lycaste</i> ,	„ „	<i>T. lyncida</i> .
<i>Tachyris zarinda</i> ,	„ „	<i>T. nero</i> .
<i>Tachyris ithome</i> ,	„ „	<i>T. nephele</i> .
<i>Eronia tritæa</i> ,	„ „	any other species.
<i>Iphias glaucippe</i> ,	„ „	<i>I. glaucippe</i> (Java var.).

In all these cases, comprising a large proportion of the *Pieridæ* peculiar to Celebes, the species of that island have the anterior wings either more elongated or more acute, or the costa much more abruptly curved near the base, than in the allied species from any of the adjacent islands. Exactly the same peculiarity was found in almost every species of *Papilio*, and is to be noticed also in many of the *Nymphalidæ*. I am not aware that any similar case has yet been adduced of a peculiarity of form running through several distinct families, and characterizing a single island only, or any equally limited district. The nearest approach to it is the apterous condition of many *Coleoptera* of usually winged genera in Madeira, conjoined with the rather fuller development of the wings in some other species, whose habits render flight essential to them. We are all acquainted with Mr. Darwin's beautiful explanation of these facts, on the principle of the preservation of useful variations, and we cannot doubt that the same principle has acted in the case of the Celebes butterflies, although from our ignorance of all the physical and biological peculiarities of that island we are not able to trace the process with so much certainty as in the other case. The whole fauna of Celebes is isolated and fragmentary, and indicates a very ancient origin and much extinction of species; and it may well be that the conditions which once rendered this peculiarity an advantageous one no longer exist. We must ever remember that the present condition of a fauna is but the resultant of an immense

variety of causes and changes, organic and inorganic, acting and reacting throughout all preceding ages. It is, therefore, no objection to a theory that it does not explain everything, but rather the contrary. A true theory will certainly enable us to understand many of the phenomena of life, but owing to our necessarily imperfect knowledge of past causes and events, there must always remain complicated knots that we cannot disentangle, and dark mysteries on which we can throw but a straggling ray of light.

The Eastern *Pieridæ* present us with none of those wonderful cases of mimicry which characterize the American genus *Leptalis*, and whose perfection enabled Mr. Bates to arrive at a satisfactory explanation of the phenomenon. The comparatively small range of colour and marking in the genera *Euplœa* and *Danaïs* offer few facilities for that first accidental approximation which is the necessary groundwork for the production of a more perfect resemblance. Nevertheless there are a few interesting cases which I think must come under the head of mimicry. The first is that of the Eastern species of *Eronia*, the females of which all approximate, more or less, to the markings of the genus *Danaïs*. The particular circumstance that makes it probable that this is a true case of mimicry is, that in several species a variety of the female occurs with the base of the hind wings bright yellow, exactly corresponding to the colour of other species of *Danaïs*. Thus in Malacca and Sumatra the ordinary dark female of *Eronia valeria* mimics *Danaïs similis*, while the yellow variety is like *Danaïs philomela*. In the Moluccas and New Guinea the dark females of *Eronia argolis* and *Eronia iobæa* are like *Danaïs sobrina* and *Danaïs meganira*, while the yellow varieties resemble *Danaïs clcona* and *D. gloriola*.

There seems, however, to be a group within the family of *Pieridæ* itself which is the subject of mimicry. This is the genus *Thyca*, which comprises the most gay and variegated species, and is very abundant both in species and individuals, which are almost entirely confined to the forests, and have a very slow and weak mode of flight. They are, therefore, singularly parallel to the South American *Heliconiidae*, and probably like them have some special protection which renders escape by flight less necessary to them than it is to the species of allied genera. That this is the case is rendered more probable by the fact that I can point out four species of other genera that resemble them most curiously in details of colouring: *Prioneris thestylis* has the under surface

marked and coloured almost exactly as in *Thyca belladonna*, and the female resembles the same insect almost as much on the upper surface; both are found at Darjeeling. *Pieris sitana*, a species peculiar to Ceylon, wonderfully resembles on the underside the common *Thyca eucharis* which ranges all over India. *Prioneris cornelia* of Borneo, as figured by Vollenhoven, is so like *Thyca singhapura* that I at first thought it might be a variety of that species till I found by the description that it was structurally different. Lastly, *Pieris læta* of Timor departs so much from the style of colouring of its allies and approaches so nearly to that of *Thyca belisama* of Java, that I should almost look for an ally of the last species to be discovered in Timor to serve as its pattern. We know so little of that island at present, and so many species having the same distribution as *T. belisama* extend to Timor, or are represented there by an allied form, that we might, quite independently of any connexion with *P. læta*, expect such a species to be found there. On the whole, then, I think we have sufficient facts to show that phenomena of mimicry, small in amount but of the same character with those that are so fully developed in many other groups, do occur among the *Pieridæ*; and this is just what we might expect sometimes to meet with in nature, for whenever a group of species possesses any amount of special protection, even if it only leads some few of their enemies to avoid them, it will then become advantageous for the species of other groups to be mistaken for these, and any accidental variations that may tend to bring about a resemblance will generation after generation survive, till further imitation ceases to be useful or is overbalanced by some concurrent disadvantage.

In a few cases what appears to be a dimorphic female occurs; the difference being however one of colour only. In *Tachyris paulina*, the female (*neombo*, Boisd.) is either white with a pearly gloss beneath, or yellow with the underside rich ochre. In an insect which I consider with some hesitation to be the female of *Tachyris celestina*, a pure white and a rich yellow variety also occur. In *Tachyris cycinna* both sexes are either greenish sulphur-yellow or rich chrome-orange. In *Tachyris zarinda* the males are either clear reddish-orange or deep burnt crimson. In none of these cases have intermediate forms ever been found, and though we have no direct proof in any case that the two forms are continually produced from a single pair of individuals, there is every reason from analogy to suppose that such is the fact. It is

interesting to find, however, that dimorphism, which is so strikingly developed among the *Papilionidæ*, should be represented in a smaller degree in the closely allied group.

A very curious case of close resemblance occurs between two other insects, *Pieris cynis* and *Tachyris illana*, which well illustrates the difference between resemblance produced by the mere recurrence of a general type of colouring and that which is the result of the preservation of useful variations, and which is termed "mimicry." These two butterflies are nearly of the same size, of a white colour with a broad apical black border similarly scalloped within, and on the hind wings both have a similarly-formed sub-macular dusky border. They differ, however, in the proportion of the discoidal cells and in the structure of the antennæ and anal valves, so as to come into distinct genera, and they are not found together, one being an inhabitant of the Malay Peninsula, the other of the Philippine Islands. If the markings of these insects had been more varied and peculiar, it would have furnished one case for the opponents of the explanation of "mimicry" by natural selection. As it is, however, it well illustrates the exception that proves the rule. By far the most general type of colouring in the *Pieridæ*, and which recurs in hundreds of species, is a white ground with a black outer border, always most developed at the apex of the upper wings, and very frequently less marked on the hind wings. It is not, therefore, surprising that among the many slight modifications of this commonest and most simple type of colouration, two species belonging to different genera should closely resemble each other externally. It is a case that exactly corresponds to the very common type of colouration among the *Carabidæ*,—black elytra with two or four rufous spots,—which recurs so frequently in many distinct genera of that family. Such cases serve to show us how completely inadequate is the law of "reversion to a common type" to explain the resemblance, through all the minute details of a complicated and unusual style of marking and colouration, which is often found in cases of "mimicry."

Although the differences of neurulation offer excellent characters for the establishment of genera, it is of too uncertain and variable a nature to serve as a complete test of their affinities to each other. I have therefore endeavoured to arrange the genera in a natural series rather by the form of the antennæ, which seems less liable to sudden and abnormal variations, and by other general characters; commencing as usual with the long and slender antennæ of the weak-flying *Leptalis* and *Euterpe*, and ending with the thick

antennæ of the strong-winged *Callidryas*. The chief difference from the usual arrangement is in placing *Terias* before *Pieris* and after Felder's new genus *Elodina*, which has hitherto been divided between *Pieris* and *Terias*.

The portion of my work to which I have devoted most time and attention has been the proper determination of the sexes in many species of *Pieris* which have hitherto never been properly located, and the separation of the heterogeneous mass of species in that genus into natural groups. As a first step I went carefully through the whole of my collection and determined the sex of every specimen. This was a matter of some difficulty, as there are no prominent sexual characters in the group, and I soon found that differences of colouration and in the form of the wings were very deceptive and had led to many errors. A little examination however soon convinced me that the presence of anal valves in the male, almost as well marked as in the genus *Papilio*, offered a certain test of sex in *Pieris* and its allies, and as my collection contains good series of many of the species from different localities, I was soon led to satisfactory results in many cases. At the same time I made the important observation that an extensive series of species, evidently all closely allied, were characterized by large tufts of stiff hairs or bristles springing from the base of each anal valve and often extending beyond their extremity. Both African and American species closely allied in form and colouration had the same character, which moreover was not found to exist in any other group of *Pieridæ*. The character is not one which has been hitherto used in characterizing genera, but as its presence is in every case easily ascertained and it groups together species which are evidently closely allied, it is probably of physiological importance; and as it enables us to break up into natural divisions a very unwieldy mass of species, I have determined to form the group so characterized into a genus which I term *Tachyris*, as they have most of them pointed wings and a very rapid flight. *Pieris panda*, Godt., and *Pieris nero*, Fab., may be considered the types.

The genus *Thyca*, established by Wallengren for the species of *Pieris* which have only one precellular subcostal nervule (and previously indicated as a section by Doubleday), is not adopted by Vollenhoven in his Monograph of Malayan *Pieridæ*, because he thinks it conflicts too much with other affinities. A careful examination of all the specimens having this character has led me to the opposite conclusion, since the fifty-seven species I place in the

genus *Thyca* form, with very few exceptions, a series whose affinities for each other are very clearly marked. There remains another small group of species which do not harmonize well with any of the other forms, and which have been generally scattered widely through the genus. The bond of affinity which brings them together is to be found in the costal margin of the fore wings in the males being distinctly toothed along its entire length, forming a saw-like edge often visible to the naked eye. The species which possess this peculiarity, now nine in number, are found to agree closely in every other point of general structure as well as in the form and texture of the wings and in their system of colouration; and I am informed by Mr. Watson that they have another striking peculiarity in being quite devoid of the scales termed plumules, which are present in the males of all other members of the old genus *Pieris*. Such a combination of characters appears to me to indicate generic difference, and I accordingly propose to form for them the genus *Prioneris*, of which the type will be the *Pieris thestylis*, Doubl.

There still remains in the genus *Pieris*, of which we may consider our *P. brassicæ* to be the type, a considerable number of species which agree very closely in structure, though they will range under several types of form and colouration. Even from these, however, two genera have been separated, neither of which I here admit. The genus *Aporia*, Hubn., has been adopted by some European Entomologists for *Pieris cratægi* and its allies, and it undoubtedly is a very distinct form from its European congeners. But when we see that, by means of *P. hippia*, Men., and *P. soracta*, Moore, it is allied to such different-looking insects as *P. agathon*, Gray, and *P. nabellica*, Boisd., which evidently form the fragments of an extensive natural group of species not differing in any important structural characters from the true *Pieris*, we comprehend that it is more by isolation and a specialised facies than by any generic peculiarity that these insects differ from their nearest allies. The only character that can be so considered, the short palpi of *P. cratægi*, is not constant in the allied forms. These constitute an Alpine and Arctic group of *Pieris*, and our common species is a straggler beyond the range of its closest relations.

Wallengren has separated the African *Pieris severina*, Godt., and its allies, under the name of *Pinacopteryx*, but the generic character he has given would apply to many other species. The only character by which these seem to me to differ from true

Pieris is in having the anal valves of the male more or less spined. The same character, which is not mentioned by Wallengren, is found in *P. mesentina*, Godt., *P. coronea*, Cram., and allies; the South American *P. mouste*, *P. ausia*, and others, also have it, and it reaches its maximum in *P. lycimnia*, Cram., in which the long acute curved spines are very conspicuous; but the character is quite an isolated one and varies too much in degree and is too difficult of determination in many cases to serve as a chief generic character. I therefore keep these species as a section of true *Pieris*.

My divisions of the genus *Pieris* of authors may be tabulated as follows:—

- A. One branch of the subcostal nervure
before the end of the cell THYCA (2).
- AA. Two branches of the subcostal nervure
before the end of the cell.
 - B. Males with tufts of hairs or bristles
at the anal valves TACHYRIS (3).
 - BB. Males with the anal valves bare.
 - C. Males with the costa serrated PRIONERIS (4).
 - CC. Males with the costa smooth.. PIERIS (1).

Of the external affinities of the *Pieridæ* it is impossible to say much. They have no direct relation to any other family than the *Papilionidæ*, and even with those there is no good connecting link. The European genera *Zegris* and *Thais* are perhaps the nearest, since they not only offer some approximation in the structural characters of the imago, but agree also to some extent in their metamorphoses, the larvæ of both genera enclosing themselves in a delicate web.

In the following list of species I have endeavoured to arrange them in a natural series, and have described the new forms chiefly by comparison with well known types. I have not thought it necessary to burden the Catalogue with many synonyms, but have in most cases referred only to Boisduval's "*Spécies Général des Lépidoptères*" and to Vollenhoven's Monograph for the species mentioned by those writers, except in cases in which there has been confusion of sexes, varieties, or general synonymy. To avoid confusion between two works with almost identical titles, I quote the first (quarto) Catalogue of the East India Company's Museum, published in 1829, as, "Horsfield, Cat. Lep. E. I. C.;" and the second (octavo) Catalogue of 1857, as, "Moore, Cat. Lep. E. I. C." To make the list of described species in the

family as complete as possible I have introduced all those described by Boisduval in the "Bulletin" of the French Entomological Society, by Lucas in the "Revue et Magasin de Zoologie," and by Felder in the "Voyage of the Novara," although I have not been able to examine several of them, and have had to some extent to guess at their true position and affinities.

I have drawn out a table (inserted at the end of the Catalogue) showing the distribution of each species, as far as yet known, in the island groups and regions, and in which I have linked together by brackets the closely allied species which may be considered as "geographical forms" or "local varieties" by many Entomologists. Other tables show the distribution of the genera in a similar manner.

For convenience of reference I add a list of the new species described, and of the old ones whose names have been altered.

NEW SPECIES.

- | | |
|--------------------------------------|--|
| 1. <i>Pontia dione</i> , n. s. | 24. <i>Thyca singapura</i> , n. s. |
| 2. <i>Elodina bouruensis</i> , n. s. | 25. <i>Thyca ennia</i> , n. s. |
| 3. <i>Elodina signata</i> , n. s. | 26. <i>Thyca philotis</i> , n. s. |
| 4. <i>Terias australis</i> , n. s. | 27. <i>Thyca echo</i> , n. s. |
| 5. <i>Terias ingana</i> , n. s. | 28. <i>Thyca hippodamia</i> , n. s. |
| 6. <i>Terias sinta</i> , n. s. | 29. <i>Thyca orphne</i> , n. s. |
| 7. <i>Terias rubella</i> , n. s. | 30. <i>Tachyris clavis</i> , n. s. |
| 8. <i>Terias fimbriata</i> , n. s. | 31. <i>Tachyris abnormis</i> , n. s. |
| 9. <i>Terias silhetana</i> , n. s. | 32. <i>Tachyris urania</i> , n. s. |
| 10. <i>Terias diversa</i> , n. s. | 33. <i>Tachyris amarella</i> , n. s. |
| 11. <i>Terias celebensis</i> , n. s. | 34. <i>Tachyris cynisca</i> , n. s. |
| 12. <i>Terias virgo</i> , n. s. | 35. <i>Tachyris panthea</i> , n. s. |
| 13. <i>Pieris mentes</i> , n. s. | 36. <i>Tachyris corinna</i> , n. s. |
| 14. <i>Pieris narses</i> , n. s. | 37. <i>Tachyris galba</i> , n. s. |
| 15. <i>Pieris jael</i> , n. s. | 38. <i>Tachyris bouruensis</i> , n. s. |
| 16. <i>Pieris naomi</i> , n. s. | 39. <i>Prioneris Vollenhovii</i> , n. s. |
| 17. <i>Pieris tamar</i> , n. s. | 40. <i>Idmais fulvia</i> , n. s. |
| 18. <i>Pieris corva</i> , n. s. | 41. <i>Thestias venatrix</i> , n. s. |
| 19. <i>Pieris copia</i> , n. s. | 42. <i>Thestias pirenassa</i> , n. s. |
| 20. <i>Pieris amba</i> , n. s. | 43. <i>Thestias dissimilis</i> , n. s. |
| 21. <i>Thyca pandemia</i> , n. s. | 44. <i>Iphia borneensis</i> , n. s. |
| 22. <i>Thyca parthenope</i> , n. s. | 45. <i>Callidryas phlegæus</i> , n. s. |
| 23. <i>Thyca ninus</i> , n. s. | |

NEW NAMES GIVEN TO DESCRIBED SPECIES.

- | | | |
|-----------------------------|---|---|
| <i>Thyca pyramus</i> | = | <i>Pieris thisbe</i> , Gray (<i>nec</i> Cramer). |
| <i>Tachyris alope</i> | = | <i>Pieris amasene</i> , Boisd. (<i>nec</i> Cramer). |
| <i>Tachyris Lucasii</i> | = | <i>Pieris pandione</i> , Boisd. (<i>nec</i> Hübner). |
| <i>Thestias Vollenhovii</i> | = | <i>Thestias balice</i> , Voll. (<i>nec</i> Boisd.) |

NAMES ALTERED TO OTHERS BEFORE IN USE.

NAMES REJECTED.

Pieris pallene, Hewits.
Terias zama, Feld.
Terias tondana, Feld.
Pieris Wallaceana, Feld.
Pieris perithea, Feld.
Pieris Descombesii, Voll. (*nec* Boisd.)
Pieris Lorquini, Feld.
Pieris hagar, Voll.
Papilio zelmira, Cram.
Pieris eleonora, Boisd.
Pieris cilla, Feld.
Pieris sulphurca, Voll.
Pieris neombo, Boisd.
Pieris albina, Boisd.
Pieris galene, Feld.
Pieris darada, Feld.
Pieris melania, Boisd. (*nec* Fab.)
Pieris zoe, Voll.
Pieris agave, Feld.
Pieris paulina, Boisd. (*nec* Cram.)
Pieris ocina, Hewits.
Pieris liberia, Voll. (*nec* Cramer).
Pieris ægis, Feld.
Pieris Helfer, Feld.
Eronia gæa, Feld.
Iphia Felderi, Voll.
Gonepteryx urania, Butler

NAMES ADOPTED.

= *Elodina angulipennis*, Lucas.
 = *Terias zita*, Feld. ♀.
 = *Terias tominia*, Voll.
 = *Pieris rachel*, Boisd. ♀.
 = *Pieris nabis*, Lucas. ♀.
 = *Thyca zebuda*, Hewits.
 = *Thyca Rosenbergii*, Voll.
 = *Tachyris cardena*, Hewits.
 = *Tachyris nerissa*, Fab. ♀.
 = *Tachyris hippo*, Cram. ♂.
 = *Tachyris ada*, Cram. var.
 = *Tachyris panda*, Godt. ♀.
 = *Tachyris paulina*, Cram. ♀ var.
 = *Tachyris paulina*, Cram. ♂.
 = *Tachyris paulina*, Cram. ♂ var.
 = *Tachyris paulina*, Cram. ♂ var.
 = *Tachyris ega*, Boisd. ♀.
 = *Tachyris Jacquini*, Lucas.
 = *Tachyris Jacquini*, Lucas.
 = *Tachyris leptis*, Feld.
 = *Tachyris cyciuna*, Hewits ♀.
 = *Tachyris eliada*, Hewits.
 = *Tachyris illana*, Feld. ♀.
 = *Prioneris clemathe*, Doubl.
 = *Eronia hippia*, Fab.
 = *Iphia sulphurea*, Wallace.
 = *Dercas Walliehii*, Doubl.

SPECIES OMITTED AS UNRECOGNIZABLE.

Papilio perimale, Donovan. (See *Pieris narses*.)
Papilio clytie, Donovan. (See *Pieris teutonia*.)
Papilio melania, Fab. (See *Tachyris ega*.)

PIERIDÆ.

PONTIA, Boisd.

A small group of delicate eastern and tropical butterflies, generally placed next *Leucophasia*, with which, however, it seems to have no near affinity. These insects fly about slowly in woods and shady places, keeping near the ground and often settling on leaves and flowers. The species are all very closely allied to each other. They are absent from the Moluccas and New Guinea, but extend through the islands east of Java to Timor, and thence into North West Australia.

1. *Pontia nina*, Fabricius.

Papilio nina, Fab. Ent. Syst. III. i. p. 194. *Pontia nina*, Bd. Sp. Gén. p. 431; Voll. Mon. Pier. p. 3.

Hab.—Malacca, Sumatra, Borneo, Java, Baly, Flores, Timor (Coll. Wall.); Philippine Is. (B. M.); India, Ceylon (B. M.).

This species varies but little throughout this extensive range. The specimens from the Philippine Islands are very large.

2. *Pontia Crookera*, MacLeay.

Pontia Crookera, MacLeay, King's Survey, p. 458; Bd. Sp. Gén. p. 431.

Hab.—West Australia.

3. *Pontia niobe*, Wallace.

Pontia niobe, Wall. Proc. Zool. Soc. 1866, p. 357.

Hab.—Formosa (Coll. Wall. ex Swinhoe).

Near *P. nina*, but a sufficiently distinct local modification.

4. *Pontia dione*, n. sp.

Much larger than *P. nina*, discoidal spot similar but larger, apical spot wanting, apical and basal margins somewhat dusky. Beneath with the irrorations browner than in *P. nina*, and extending more over the upper wings, which have an apical dusky patch. Antennæ long, tipped with dusky orange.

Expense 2—2 $\frac{1}{8}$ inches.

Hab.—Macassar (Coll. Wall.).

5. *Pontia medusa*, Cramer.

Papilio medusa, Cr. 150 F. *Pontia medusa*, Bd. Sp. Gén. 433.

Hab.—Bengal.

A large and finely coloured species according to Cramer's figure.

6. *Pontia lignea*, Vollenhoven.

Pontia lignea, Voll. Mon. Pier. p. 4, pl. 2, f. 1 a, 1 b, ♂.

♀. Above dusky white, costal margin dusky irrorated; a discoidal spot as in *P. nina*, and a small indistinct one above it within the apex; hind wings with a narrow dusky margin. Beneath dusky and thickly irrorated, with a greenish tinge on the apex of

the upper and over the whole surface of the hind wings; discoidal spot on uppers dusky black. Antennæ orange-tipped.

Expanse $1\frac{5}{8}$ inch; wings more elongate than in *P. nina*.

Hab.—Menado, Celebes (Coll. Wall.).

A very distinct species, with more elongate wings than its allies.

ELODINA, Felder.

Voy. Novara, Lep. p. 215.

This is a group of small delicate white and black butterflies, which have a peculiar type of neurulation, there being only one subcostal nervule before the end of the cell, and the lower radial is situated so high up as to appear like a branch of the subcostal at the end of the cell. The type has been considered a *Terias*, and others have been placed in the genus *Pieris*. They seem allied to both *Pontia* and *Terias*, and are the only well marked group of *Pieridæ* which are entirely confined to the Australian region. The species yet known are all very closely allied to each other.

1. *Elodina egnatia*, Godart.

Pieris egnatia, Godt. Enc. Méth. ix. p. 138. *Terias egnatia*,
Bd. Sp. Gén. p. 678.

Hab.—N. Celebes (Wall.); Amboina (Bd.); Aru Islands (Wall.); Timor (Wall.)

The Timor specimen is smaller and has the dusky mark beneath the uppers reduced to a subquadrate spot, but I do not like to separate it.

2. *Elodina hypatia*, Felder.

Elodina hypatia, Feld. Voy. Novara, p. 216.

Hab.—New Guinea (Coll. Wall.).

Distinguished by the upper wings having beneath a black apex enclosing a white stripe; but in some specimens these markings are almost or quite obsolete, and they then only differ by the costa above being more broadly dusky at the base.

3. *Elodina thersasia*, Felder.

Elodina thersasia, Feld. Voy. Novara, p. 215.

Hab.—Gilolo.

"Above, like *E. egnatia*; beneath, has the apex beyond the dark patch dusky." I have not seen this species.

4. *Elodina bouruensis*, n. sp.

Above, has the costal and outer margins broadly black with a dilated apex, and the base broadly dusky; beneath, a curved blackish band across the apex is continued along to near the base of the costal margin; the rest as in *E. egnatia*.

Hab.—Bouru (Coll. Wall.).

A sufficiently distinct species, if any of the forms of *E. egnatia* are to be separated.

5. *Elodina angulipennis*, Lucas.

Terias angulipennis, Lucas, Rev. et Mag. de Zool. 1852, p. 431.

Pieris pallene, Hew. Ex. Butt. vol. i. Pieris II. f. 8, 9.

Hab.—Australia.

Very distinct by the band of spots across the hind wings beneath.

6. *Elodina padusa*, Hewitson.

Pieris padusa, Hew. Ex. Butt. vol. i. Pieris II. f. 10, 11.

Hab.—Australia.

Comes near *E. egnatia*, from which it differs chiefly in form.

7. *Elodina parthia*, Hewitson.

Pieris parthia, Hew. Ex. Butt. vol. i. Pieris II. f. 12, 13.

Hab.—Australia.

8. *Elodina signata*, n. sp.

Above: upper wings black, with a somewhat irregular ovate central white patch; lower wings white, inner margin with a black border, outer margin finely dusky and with the ends of the nervures black.

Beneath: the apex of the uppers white, the ovate patch yellowish, the base slightly dusky; lower wings white, dusky at the base, with a transverse band of dusky lunules between the cell and the outer margin. In another specimen, without abdomen (? ♂), the lower wings immaculate beneath.

Expanse of wings $1\frac{1}{2}$ inch.

Hab.—New Caledonia (B. Mus).

TERIAS, Swainson.

These small white and yellow butterflies are generally distributed throughout the tropics, where they frequent gardens and plantations and the skirts of the forests rather than their deeper recesses. They also assemble on the margins of streams and on the sea beach. These habits lead to their being frequently carried off by winds, and it is thus perhaps that some of the species have so wide a range and offer such perplexing variations. From their great similarity, and their commonness in the tropics, they have been somewhat neglected, and we do not yet possess materials sufficient to determine the limits of many of the forms. I have described a few new species which appear to be sufficiently distinct, but the whole genus is at present in a very unsatisfactory condition.

1. *Terias harina*, Horsfield.

Terias harina, Horsf. Cat. Lep. E. I. C. p. 137; Bd. Sp. Gén. p. 668.

Hab.—India, Malacca, Java, Borneo, Philippines, Celebes, Batchian, Ceram, Aru Islands (Coll. Wall.).

This species varies little; the specimens from the Moluccas have the apical border narrower than in those from the western islands. The female is much paler and sometimes has a broader apical border. The Philippine form has a narrow border to the hind wings, and might almost be considered a distinct species.

2. *Terias angulata*, Wallengren.

Terias angulata, Walleng. Wien. Ent. Monats. iv. p. 34.

“Alis posticis angulatis; omnibus albis, margine exteriori late nigro, introrsum undulato, maculaque flava ad angulum anticum alarum posticarum notato, basi in parte superiore alarum anticarum pone cellulam albo-flavescente.” (Walleng.)

Hab.—Sandwich Islands.

3. *Terias læta*, Boisduval.

Terias læta, Bd. Sp. Gén. p. 674.

Hab.—N.W. India, Afghanistan, Nepaul, Bhotan (B. M.).

4. *Terias venata*, Moore.

Terias venata, Moore, Cat. Lep. E. I. C. p. 65, pl. IIa. f. 2, ♂.

Hab.—N. W. India.

The female scarcely differs, except in being more dusky.

5. *Terias santana*, Felder.*Terias santana*, Feld. Voy. Novara, p. 211.*Hab.*—Bengal, Philippine Islands.

This appears scarcely to differ from *P. venata*, Moore. The female described by Dr. Felder seems undoubtedly to be my *P. vagans*. I was about to describe the Philippine species as distinct, but find that it agrees minutely with Dr. Felder's description. It may nevertheless not be the same. The wings are rather less acute than in *T. venata*, and the fringe is narrower and more dusky.

6. *Terias vagans*, Wallace.*Terias vagans*, Wall. Proc. Zool. Soc. 1866, p. 357; Feld. Voy. Novara, p. 211, ♀ (*T. santana*)?.*Hab.*—N. India, Formosa (Coll. Wall. ex Swinhoe).7. *Terias smilax*, Donovan.*Papilio smilax*, Don. Ins. N. Holl. pl. 20. *Terias smilax*, Bd. Sp. Gén. p. 660.*Hab.*—Australia, Moreton Bay (Coll. Wall.).Closely allied to *T. vagans* and *T. venata*.8. *Terias herla*, MacLeay.*Pieris herla*, MacLeay, King's Survey, p. 460; Bd. Sp. Gén. p. 660.*Hab.*—Australia (Coll. Wall.).

A very distinct species by its reddish under surface; the specimens vary somewhat in outline, some having the apex more rounded, and the black border terminating less abruptly, but they can hardly be considered distinct. One specimen in the B. Mus. has almost lost the red tint of the under surface.

9. *Terias australis*, n. sp.

Form and size of *T. smilax*, but the wings more elongate, fringe yellow instead of red.

Above: upper wings as in *T. smilax*, but the border reaches the outer angle. Lower wings with a black border, scalloped

within, widest at the outer angle and vanishing before reaching the anal angle.

Beneath: rich yellow; upper wings with two minute discoidal dots, and marginal dots as in *T. smilax*; lower wings scantily speckled with black scales, a discoidal and a submarginal small black spot towards the base, and very faint transverse dusky bands as in *T. smilax*.

Hab.—Australia, Moreton Bay (B. M.).

10. *Terias ingana*, n. sp.

The second subcostal branch and the disco-cellular nervure of the lower wing arising close together as in *T. herla*. Wings elongate, uppers with a black border at the apex not quite reaching the outer angle, above which are two rounded indentations; lower wings with a row of marginal dots, sometimes connected by a narrow black edging; a black mark sometimes appears at the end of the cell. Beneath: upper wings with a black discoidal spot and minute marginal dots; lower wings with discoidal and basal spot as in *T. australis*, sometimes another within the cell, and a transverse curved dusky band, sometimes very distinct, at others almost obsolete. Black points at the ends of the nervures. Fringe of the upper wings dusky, of the lower yellow. Female paler.

Expanse of wings $1\frac{1}{2}$ inch.

Hab.—Australia, Sidney (B. M.).

11. *Terias sinta*, n. sp.

Form of *T. smilax*; border of upper wings narrower, entire and slightly scalloped within, not reaching the outer angle; lower wings with minute dots at the end of the nervures. Beneath: uppers with a very faint discoidal spot; lower wings faintly black-speckled, and with spots and band as in *T. australis*, more or less faintly indicated. Fringe yellow; no black marginal dots beneath.

Expanse $1\frac{1}{2}$ inch.

Hab.—Australia, Moreton Bay (B. M.).

12. *Terias senna*, Felder.

Terias senna, Feld. Voy. Novara, p. 212.

Hab.—Malacca.

13. *Terias drona*, Horsfield.

Terias drona, Horsf. Cat. Lep. E. I. C. p. 137, t. 1, f. 13; Bd. Sp. Gén. p. 675.

Hab.—Java, Flores, Timor, Bouru, Ternate, Celebes, Ceram (Coll. Wall.).

14. *Terias lerna*, Felder.

Terias lerna, Feld. Sitz. Akad. d. Wiss. 1860, p. 449; Voy. Novara, p. 212.

Hab.—Amboina, Australia (Wall.); India (Feld.).

This species is exactly like *T. drona* above, but differs considerably on the under surface.

15. *Terias rubella*, n. sp.

Above, like *T. drona*, but the wings are shorter, and the outer margin of the uppers slightly concave, the black border of the hind wings narrower, toothed at each nervure, not reaching the anal angle, the fringe and two spots on the costa near the apex brick-red. Beneath, marked like *T. drona*, but the whole costal margin and the fringe clear brick-red. Club of antennæ beneath, palpi and head also red.

Expanse of wings $1\frac{1}{4}$ inch.

Hab.—Calcutta (Coll. Moore), Darjeeling, China (B. M.).

This pretty little species is quite distinct from *T. drona* in form, although closely resembling it in markings.

16. *Terias fimbriata*, n. sp.

Form of *T. hecabe*. Above, clear yellow; a black border at the extremity of the uppers from the end of the first subcostal nervule to the outer angle, pretty regularly toothed within and dilated into a small apical patch, in which is a dusky indentation. The lower wings have only a black spot at the end of each nervule; fringe yellow. Beneath: the whole surface is speckled with minute black dots, a small spot at the end of each nervure, and three or four on the costal margin; on the uppers a brown lunule at the end of the cell, a zigzag mark in the middle, and a smaller one near the base, and a line of three or four reddish spots between the cell and the apex; lower wings with a large brown discoidal

lunule, three small ocelli near the base, and a faint irregular sub-marginal band of brown spots. Head and thorax dusky.

Expanse of wings $1\frac{7}{8}$ inch.

Hab.—Mussooree, N. India (Coll. Moore).

Distinguished from *T. blanda* by its costa not black-margined, the yellow fringe, and other characters.

17. *Terias silhetana*, n. sp.

Above, clear yellow; a black border at the extremity of the upper wing, commencing abruptly between the first and second subcostal nervules, and reaching the outer angle, not regular within and dilated into a quadrate patch at the apex; fringe black. Lower wings with a very narrow black edge, slightly dilated at the extremity of the nervures and with a yellow fringe. Beneath, with blackish-brown markings, disposed nearly as in *T. fimbriata*, but with a rusty-brown quadrangular patch at the apex; surface sparsely dotted with dusky scales, fringe of both wings yellow. Head and thorax dusky-yellow.

Expanse of wings $1\frac{3}{4}$ inch.

Hab.—Silhet (Coll. Moore).

A well-marked species, although closely allied to *T. sari* and *T. blanda*.

18. *Terias blanda*, Boisduval.

Terias blanda, Bd. Sp. Gén. p. 672.

Hab.—Bouru, Amboina, Batchian, New Guinea (Wall.); Java (Voll.); China, N. India (Moore).

The black border is not quite *regularly* toothed or sinuated within as Boisduval describes it, yet I believe this must be his species. The Indian specimen agrees, but has the border of the hind wings very narrow.

19. *Terias phanospila*, Felder.

Terias phanospila, Feld. Voy. Novara, p. 209.

Hab.—Java.

20. *Terias diversa*, n. sp.

Male.—Colour rich yellow; markings intermediate between *T. blanda* and *T. hecabe*.

Female.—White; base somewhat dusky, markings as in the male.

Hab.—Bouru, Ternate, Ceram, Goram, Aru Islands, New Guinea, Philippine Islands (Wall.).

The males often hardly differ from *T. hecabe*, but the remarkable difference in the colour of the females seems to render it necessary to separate the form. A species from the Philippine Islands sent me as *T. alitha* agrees well with this species.

21. *Terias hecabe*, Linnæus.

Papilio hecabe, Linn. S. N. ii. p. 763. *Terias hecabe*, Bd. Sp. Gén. p. 669.

Hab.—India, Sumatra, Borneo, Java (Wall.); Australia (B. M.).

Var. *suava*, Boisd. l. c.

Hab.—Sumatra, Flores, Timor, Matabello (Wall.); India (Bd.); China (B. M.).

The varieties of this species are infinite over its extensive range, and cannot be profitably separated.

22. *Terias sinensis*, Lucas.

Terias sinensis, Luc. Rev. et Mag. Zool. 1852, p. 429.

“Near *T. hecabe*. Wings pale yellow; uppers with a border larger and less black than *hecabe*, toothed within, with the sinus less well formed. Border returning partly up the inner margin as in *T. tilaha*. Border of lower wings wider than in *hecabe* and *tilaha*. Beneath paler than above, with a marginal row of small black dots, indistinct near the fringe, otherwise without spots or markings. In the ♀ the inner margin is not black-bordered, and the margin of the lower wings is narrower.” (Lucas.)

Hab.—China.

23. *Terias nicobariensis*, Felder.

Terias nicobariensis, Feld. Verh. z.-b. Gesell. Wien. 1862, p. 480.

Hab.—Nicobar Islands.

“Near *T. hecabe*.”

24. *Terias anemone*, Felder.

Terias anemone, Feld. Wien. Ent. Monats. vi. p. 24.

Hab.—Ningpo, China.

“Near *T. hecabe*.”

25. *Terias sari*, Horsfield.*Terias sari*, Horsf. Cat. Lep. E. I. C. p. 136.*Hab.*—Malacca, Sumatra, Java (Wall.); Borneo (Moore); Flores, Timor, Australia (Wall.).

A specimen from Queensland hardly differs except in having the border of the hind wings rather narrower, and the apical patch beneath smaller; and another somewhat intermediate form occurs at Flores and Timor.

26. *Terias eumide*, Felder.*Terias eumide*, Feld. Voy. Novara, p. 214, ♂.

The female differs by being of a paler yellow, and sometimes much irrorated with dusky.

Hab.—N. Celebes, Sula Islands (Wall.). Var. Batchian (Wall.).

This is intermediate between *T. hecabe* and *T. tilaha*. The Batchian variety has the border less abruptly sinuated.

27. *Terias tilaha*, Horsfield.*Terias tilaha*, Horsf. Cat. Lep. E. I. C. p. 136; Bd. Sp. Gén. p. 668; Voll. Mon. Pier. p. 65 (pt.).*Hab.*—Java (Wall.); Borneo (Voll.).28. *Terias Lorquini*, Felder.*Terias Lorquini*, Feld. Voy. Novara, p. 209; Voll. Mon. Pier. p. 65 (*T. tilaha*, pt.).*Hab.*—Celebes, Macassar and Menado (Wall.).

A beautiful species, distinct from *T. tilaha* of the western islands.

29. *Terias alitha*, Felder.*Terias alitha*, Feld. Wien. Ent. Monats. vi. p. 289.*Hab.*—Mindanao (Philippines).Closely allied to *T. Lorquini*.30. *Terias zita*, Felder.*Terias zita*, Feld. Voy. Novara, p. 210, ♂.*T. zama*, Feld. l. c. ♀.*Hab.*—Celebes, Menado (Coll. Wall.).

This species is hardly distinct from *T. Lorquini*, as my Collection shows that great variation occurs in this group of *Terias*.

31. *Terias tominia*, Vollenhoven.

Terias tominia, Voll. Mon. Pier. p. 66, pl. 7, fig. 4, ♀.

T. tondana, Feld. Voy. Novara, p. 214, tab. xxvi. figs. 1, 2,
♂, ♀.

Hab.—Macassar and Menado (Celebes), and the Sula Islands (Coll. Wall.)

This very handsome species varies much in the extent of the black borders in both sexes. I possess a female in which the wings are entirely dusky black above.

This (with several other species) has been described by both Vollenhoven and Felder, in works dated the same year, but as that of Vollenhoven was first published and sold, I have been obliged to adopt his names.

32. *Terias celebensis*, n. sp. (Pl. VI. fig. 1, ♂.)

Male.—Above, black, with a suborbicular yellow patch extending from near the costa of the upper wings to just below the cell of the lower wings, twice sinuated towards the apex of the uppers, elsewhere regularly curved. Beneath, yellow, with spots arranged as in *T. tominia*.

Female.—Dusky black, with a small subovate yellow patch across the end of the cell of the upper wings. The lower wings with the inner margin yellow, extending in an ovate patch between the cell and the outer angle.

Expanse of wings $1\frac{7}{8}$ inch to $2\frac{1}{8}$ inches.

Hab.—Macassar, Menado, Sula Islands (Wall.).

This beautiful and very distinct species forms an interesting transition to the male of *T. candida*. It is restricted to the Celebes district, which includes the Sula Islands.

33. *Terias candida*, Cramer.

Papilio candida, Cr. 331 A, ♀. *Terias candida*, Bd. Sp. Gén. p. 673; Voll. Mon. Pier. p. 68.

Hab.—Amboina, Ceram, Bouru, Ké Island (Coll. Wall.); Timor? (Voll.).

This species is well distinguished by the abdominal margin being black or dusky in both sexes. Vollenhoven says it is found

in Sumatra and also in Celebes; the former locality is so improbable that I unhesitatingly reject it in the absence of direct evidence, and as to the latter perhaps a specimen of *T. celebensis* has been mistaken for it.

34. *Terias puella*, Boisduval.

Terias puella, Bd. Voy. Astrol. p. 60, pl. 2, fig. 8, ♂; Sp. Gén. p. 674 (*candida*, var.).

Hab.—Batchian, Gilolo, Waigiou (Coll. Wall.).

The female resembles the male, but has the border rather wider, and is of a pale sulphur-yellow above. In the male the black border is more regularly curved towards the costa than in *T. candida*, ♂. Vollenhoven (Mon. Pier. p. 69) says his specimen of a female from Ternate is white. This would agree with my *T. virgo*. Is it not an error of locality, as he does not say that the specimen was obtained from any recent collector or other trustworthy source, and many Ternate vessels visit the Aru Islands, the habitat of *T. virgo*?

35. *Terias virgo*, n. sp.

Male.—Above, rich yellow, the black border of the upper wings as in *T. candida*, of the lower wings as in *T. puella*.

Female.—Colour above, pure white as in *T. candida*, ♀; border as in *T. puella*, ♂.

Hab.—Aru Islands (Coll. Wall.).

The curious combination of characters as indicated above obliges me to separate this as a distinct species.

36. *Terias impura*, Vollenhoven.

Terias impura, Voll. Mon. Pier. p. 70, pl. 7, fig. 5.

Hab.—Timor.

The form of this small species is more like that of some of the South American species of *Terias*.

PIERIS.

This genus will now contain all the species of the old genus *Pieris* which have two subcostal nervules given off before the end of the cell, and the males of which have neither the costa serrated nor the anal valves tufted. The third subcostal nervule is generally well developed, but it varies greatly, becoming very short in

P. gliciria and its allies, and altogether absent in *P. daplidice* and in some South American species. In *P. mesentina*, *P. teutonia*, the African *P. severina*, and a few allied species, the first branch of the subcostal anastomoses with the costal, but in others closely allied, as *P. coronea*, they remain distinct. As thus restricted, the genus comprises about a hundred and twenty species distributed over every part of the globe. I divide the Eastern species into groups characterized by peculiarities of colouration, form, or unimportant details of structure, as follows :—

- a. *Coronea* group. Anal valves of male terminating in a horny point or spine; club of antennæ rather abrupt; fore wings elongate; hind wings beneath white or yellow, with the nervures more or less black and dilated.
- b. *Aspasia* group. Anal valves of male ovate; club of antennæ slender; wings generally broad; hind wings yellow or green beneath.
- c. *Cynis* group. Wings white, pearly, delicate, broad.
- d. *Gliciria* group. Wings rather elongate; club of antennæ rather abrupt; third subcostal nervule very short or wanting.
- e. *Agathon* group. Wings ample; club of antennæ ovate, flattened; palpi short; front very hairy; third subcostal of moderate length.

a. *Coronea* group.

1. *Pieris mesentina*, Cramer.

Papilio mesentina, Cr. 270 A, B. *Pieris mesentina*, Bd. Sp. Gén. p. 501.

Hab.—India (North and South) and Ceylon.

Some Ceylonese and Indian specimens have the female yellow-tinged above, and the lower wings beneath of a rich ochre-yellow colour. The males do not differ.

2. *Pieris teutonia*, Fabricius.

Papilio teutonia, Fab. Syst. Ent. III. i. p. 199; Don. Ins. N. H. i. pl. 17, fig. 1. *Pieris teutonia*, Bd. Sp. Gén. p. 473.

Hab.—Australia (Coll. Wall., B. M.).

Boisduval gives "Timor and New Guinea" also as habitats of this species; but as *P. coronea* inhabits Timor, this has probably

been mistaken for it. It is very possible it may extend into New Guinea, but it seems never to have been seen there either by myself or the Dutch Entomologists. The female is probably *P. clytie* of Donovan; and as it is useless to continue in our lists species which are unrecognizable from the badness of the figures, and are probably known under other names, I omit altogether *P. perimale* and *P. clytie*.

3. *Pieris niseia*, MacLeay.

Pieris niseia, MacLeay, King's Survey, App. p. 459; Bd. Sp. Gén. p. 473.

Hab.—West Australia.

This seems to be closely allied to *P. teutonia*, and is perhaps not distinct. I have not seen a specimen.

4. *Pieris coronea*, Cramer.

Papilio coronea, Cr. 68 B, C; 361 G, H. *Pieris coronea*, Bd. Sp. Gén. p. 474; Voll. Mon. Pier. p. 29.

Hab.—Java, Celebes, Baly, Lombock, Flores, Solor, Timor (Wall.).

As this species has not been found by the Dutch collectors or by myself in Sumatra or Borneo, the above probably gives its true range. A specimen in the Brit. Mus. is labelled "Amboina," but this is no doubt a wrong locality.

5. *Pieris peristhene*, Boisduval.

Pieris peristhene, Bd. Bull. Soc. Ent. 1859, p. 155.

"Above, like *P. clytie* ♂, but the black discoidal points larger and better marked, the marginal row of white marks less distinct. Beneath, more like *P. coronea*; the hind wings black, with a row of marginal lunules, base of the upper margin and abdominal border bright ochre-yellow. Female smaller, of a dirty yellow-white, with a much wider black border." (Boisd.)

Expanse $2\frac{3}{4}$ inches.

Hab.—Woodlark Island (S. E. of New Guinea), New Caledonia (Coll. W. W. Saunders); New Hebrides, Lord Howe's Island (B. M.).

In the New Caledonian insect the upper wings are white beneath, orange-tinged at the base, with a broad outer border and a mark

across the end of the cell purple-black, and a submarginal row of white spots; the hind wings as above described.

b. *Aspasia* group.

6. *Pieris affinis*, Vollenhoven.

Pieris affinis, Voll. Mon. Pier. p. 40, pl. 5, fig. 2, ♂.

Hab.—Macassar (Wall.); N. Celebes (Voll.).

This insect bears such a curious resemblance to *P. ithome* ♀, that it has been always considered to be the female of a closely-allied species. Owing to its having very small and smooth anal valves I had always considered it to be of that sex; but having heard that Mr. Watson had found plumules on the wing, and therefore pronounced it to be a male, I relaxed my specimens, and by opening the valves found that he was right, and that all the specimens in my own and other collections are males. This being the case it is evident that it has no close *affinity* whatever with *P. ithome*, or with any other known butterfly, so that its name will be a good example of "*lucus a non lucendo*," and will serve to recall the error to which its *analogical* resemblance to *P. ithome* ♀ gave rise. It must now come in the group of true *Pieris*, and is nearest to *P. rachel*, Bd., though forming a distinct subsection.

7. *Pieris Boisduvaliana*, Felder.

Pieris Boisduvaliana, Feld. Wien. Ent. Monats. vi. p. 287; Voy. Novara, pl. xxiv. fig. 8, ♂.

Hab.—Luzon, Philippines (♂, ♀, Wall. Coll.).

Evidently allied to *P. rachel*, but very distinct; and it is particularly interesting as showing an approach to the curious *P. affinis*, which it serves to connect with this group.

8. *Pieris rachel*, Boisduval.

Pieris rachel, Bd. Sp. Gén. p. 469, ♂.

P. Wallaceana, Feld. Voy. Novara, p. 168, ♀.

Hab.—Waigiu (Wall.); Tidore, Ceram (Voll.); Bouru (Wall.).

These specimens agree exactly with Boisduval's description, excepting only the absence of the small yellow spot on the under surface of the lower wings near the outer angle, of which a trace is found only in some Bouru specimens. He gives "Java" as the

locality, but that is not to be trusted to, as collections made in other parts of the Archipelago are so frequently to be obtained in Java. I am sorry to be obliged to cancel the name of an insect which Dr. Felder has kindly dedicated to myself.

9. *Pieris perictione*, Felder.

Pieris perictione, Feld. Voy. Novara, p. 168.

Hab.—Aru Islands.

This seems to be very near *P. rachel*. I have not seen a specimen.

10. *Pieris pitys*, Godart.

Pieris pitys, God. Enc. Méth. ix. p. 134; Bd. Sp. Gén. p. 470.

Hab.—Timor (Wall.).

The wings in this species are more rounded than in *P. rachel*, to which it is very closely allied. It is well described by Boisduval.

11. *Pieris mentes*, n. sp.

Male.—Above, like *P. pitys*, but with an ashy tinge on the fore wings, and generally two spots at the apex. Beneath: the upper wings are black, with the basal half yellow-tinged and the inner margin white, a small white mark at the end of the cell, and the apical spots (3 or 4) yellow; the hind wings as in *P. pitys*.

Hab.—Lombok, Flores (Coll. Wall. and W. W. Saunders).

The dark underside of the fore wings distinguishes this very readily from *pitys* and *rachel*.

12. *Pieris nabis*, Lucas.

Pieris nabis, Lucas, Rev. et Mag. de Zool. 1852, p. 326, ♂.

P. perithea, Feld. Voy. Novara, p. 169, ♀.

Hab.—Australia, Moreton Bay (Coll. Wall.), Sidney and W. Australia (Coll. W. W. Saunders).

A distinctly marked species, closely allied to *P. rachel*. A specimen in the Brit. Mus. from New Hebrides has the fore wings more concave, and the hind wings more triangular than in the type, and other Australian specimens vary considerably in the tint

of the under surface. This is sometimes supposed to be *P. lanassa*, Boisd., but it certainly does not agree with his description. Felder's description of his *P. perithea* ♀ so exactly agrees with this in almost all points that I cannot keep it separate.

13. *Pieris narses*, n. sp. (Pl. VI. fig. 3, ♂.)

Form of wings and markings of the upper surface exactly like *P. nabis* in both sexes. Beneath: the apex of the uppers is pale rufous-brown, and the whole surface of the lower wings earthy-brown with an orange tinge; the apical spots are obsolete, and the dusky border of the lower wings is of a deeper colour within, forming a waved submarginal band; the base of the upper wings is yellow-tinged, and the basal portion of the costa of the lower wings bordered with deep orange.

Expanse $1\frac{9}{10}$ inch.

Hab.—Moreton Bay, Australia (Coll. Hewits. ♂; Coll. W. W. Saunders, ♀).

Very close to *P. nabis*, but appears to differ constantly in the colour and marking of the under surface, which resembles *perimale* of Donovan, but the colouring of the upper surface in his figure is so different that it cannot be considered the same species.

14. *Pieris periclea*, Felder.

Pieris periclea, Felder, Voy. Novara, p. 169.

Wings more elongate than *P. narses*, which it much resembles; the outer margin of the uppers concave.

Male.—Above, white; costa and base dusky, a triangular black apical patch notched in the middle and reaching the outer angle, with a curved row of six small elongate subtriangular white spots; hind wings with a narrow dusky border, near which the nervures are black, and a faintly indicated dusky band within. Beneath: the apex of the uppers beyond the row of spots, which are less distinct, rusty-ochre; hind wings entirely earthy-ochre, with a submarginal row of seven diffused round dusky spots not far beyond the cell. The base of the uppers orange-tinged.

Expanse $1\frac{7}{8}$ inch.

A specimen in Mr. Hewitson's Collection agrees exactly above, but beneath the disc of the hind wings is ochre-yellow, the sub-

marginal dark spots form a continued irregular band, beyond which is a row of indistinct whitish spots.

Expanse 2 inches.

Hab.—New Caledonia (Coll. W. W. Saunders).

These two specimens indicate a variable species, which I had at first thought distinct from Felder's species.

15. *Pieris judith*, Fabricius.

Papilio judith, Fab. Ent. Syst. III. i. p. 202. *Acreea judith*, Hübn. Zutr. 669, 670, ♀. *Pieris judith*, Bd. Sp. Gén. p. 468; Voll. Mon. Pier. p. 21.

Hab.—Java (Wall.); (♂, ♀, B. M.).

Here commences a peculiar type of colouration, of which the present is one of the most distinct species.

16. *Pieris aspasia*, Stoll.

Papilio aspasia, Stoll, Suppl. Cr. 33, f. 3, 3 C, ♂. *Pieris aspasia*, Bd. Sp. Gén. p. 469, ♂; Voll. Mon. Pier. p. 22, ♂, ♀.

Hab.—Ceram, Amboina (Wall.).

This is the true *P. aspasia* of Stoll, but there are well marked permanent forms in each of the adjacent islands, which it seems desirable to separate. Most of these offer differences in both the sexes, and two of the females have been separately named by Vollenhoven, while he keeps the males with *P. aspasia*.

17. *Pieris emma*, Vollenhoven.

Pieris emma, Voll. Mon. Pier. p. 24, pl. 4, f. 2, ♀.

Male.—Very like *P. aspasia*. Above: the fore wings have the nervures and the border rather more broadly black, the hind wings equally rich orange, with a broader black border; beneath there are the same differences. The female differs completely from that of *P. aspasia*, more so than indicated in Vollenhoven's figure, being earthly-brown above with dull yellowish-white spots and markings. Rather larger than *P. aspasia*.

Hab.—Batchian, Gilolo, ♂, ♀ (Wall.).

18. *Pieris olga*, Eschscholtz.

Pieris olga, Eschsch. Voy. Kotzebue, pl. 9, f. 21 a, b.

Near *P. aspasia*. Hind wings somewhat angular, of a lighter

colour and with a broader black border; beneath, the fore wings are much whiter, the hind wings yellow, with the costal and subcostal nervures black-bordered. The female is intermediate between *aspasia* and *emma*, the hind wings being pale dull yellow, with a broad irregular dusky border, and on the under side the veins and markings are purple-brown.

Hab.—Philippine Islands (Coll. Wall., B. M.).

A specimen from Hong Kong in the British Museum agrees with this, but is of a reddish-orange tint on the lower wings.

19. *Pieris hester*, Vollenhoven.

Pieris hester, Voll. Mon. Pier. p. 24, pl. 4, f. 1, ♀.

Male.—Above: upper wings white, with a black border, but the veins much less black-edged than in *P. aspasia*; lower wings clear pale orange, with a black border as in *P. emma*, ♂. Beneath, differs from *P. aspasia* in the same degree as above.

Female.—Very distinct from *P. aspasia* by having the disc of the uppers yellowish-white, with a blackish border without white or yellow spots; the lower wings dusky-orange, with an ill-defined broad dusky border, more or less distinctly notched near the outer angle.

Hab.—New Guinea, Mysol, Waigion (Wall.).

20. *Pieris jael*, n. sp.

Male.—Marked as in *P. aspasia*, but the nervures more clearly defined, and the hind wings clear yellow as in *P. hester*, ♂, and with a black border slightly wider than in *P. aspasia*.

Female.—Differs in nearly the same way from the female of *P. aspasia*; the colour much paler, and the markings on the under side less diffused.

Hab.—Bouru (Wall.).

21. *Pieris lea*, Doubleday.

Pieris lea, Doubl. Ann. Nat. Hist. xxvii. p. 23; Gen. Diur. Lep. t. 6, f. 3 (err. *P. elemanthe*); Voll. Mon. Pier. p. 23, ♂ (the female as *P. amalia*, ♀).

Hab.—Borneo (Wall.); Banca (Voll.).

22. *Pieris amalia*, Vollenhoven.

Pieris amalia, Voll. Mon. Pier. p. 23, pl. 3, f. 6, ♀ (as the male).

Male.—Above, white, the border and nervures as in *P. lea*, but more clearly defined and without the obscure submarginal band; the patch on the lower wings well defined, and entirely deep orange. Beneath, very like *P. lea*, but there are three yellow spots near the apex of the fore wing, and on the hind wings the border and black nervures are narrower, and the anal region is rich orange, shading into the pure yellow of the disc.

The female has been described and figured by Vollenhoven as the male.

Hab.—Singapore (Wall.); Sumatra (Voll.).

23. *Pieris naomi*, n. sp.

Male.—Above, as in *P. amalia*, but the orange anal patch is not clearly defined. Beneath: the upper wings white, nearly covered by the thickened nervures and broad dusky margin, three yellow spots at the apex and one near the costa; lower wings entirely rich orange-red, with a rather broad purple-brown border enclosing a few reddish spots, the subcostal nervures only dusky.

Female.—Dusky brown, with whitish patches between the nervures, and a few submarginal spots, the anal region dusky orange. Beneath: the uppers nearly as above but darker; the lower wings purplish-brown, marked with ochre-yellow at the base and between the nervures.

Hab.—Lombok, Flores (Wall.).

A very distinct species, intermediate between *P. amalia* and *P. temena*.

24. *Pieris temena*, Hewitson.

Pieris temena, Hew. Ex. Butt. vol. ii. Pieris III. f. 19, ♂.

Female.—Blackish-brown, with stripes and spots between the nervures cream-white; on the hind wings the disc is reddish-white, with the nervures dusky, and a blackish hind border with irregular creamy spots. Beneath: the uppers are marked as in the male, but the spots are whiter; the lower wings are less brilliant than in the male, of mixed red and yellow, the subcostal and discoidal nervures black-bordered, and the black submarginal band more acutely toothed.

Hab.—Flores, Lombok (Wall.).

In fine specimens of the male the underside is rich orange-red. Vollenhoven (Mon. Pier. p. 25, n.) doubts this being an inhabitant of the Archipelago, because "the Museum of Leyden possesses a female specimen from New Zealand." I myself captured both sexes in Lombock, and my assistant Mr. Allen did the same in Flores. I am therefore more disposed to think that the Leyden specimen did not come from New Zealand.

25. *Pieris tamar*, n. sp. (Pl. VI. fig. 2, ♂.)

Form of wings as in *P. temena*; same size.

Male.—Above, like *P. temena*, but the black border about twice as wide. Beneath: differs from *P. temena* by the marginal and transverse rows of spots being smaller, and the patches in and below the cell much whiter and larger; the lower wings have a very wide black border extending into the end of the cell, and the submarginal red spots very small, the disc coloured as in *P. temena*.

Female.—Has a broad black border at the extremity of both wings, with a prolongation from the uppers to the end of the cell. Beneath, nearly as in the male, but the spots are rather larger and less distinctly marked.

Hab.—Baly (Coll. Wall. and W. W. Saunders).

A beautiful species, distinct in both sexes from *P. temena*, but more especially different in the female. Apparently restricted to the small island of Baly, situated between Lombock and Java.

26. *Pieris læta*, Hewitson.

Pieris læta, Hew. Ex. Butt. vol. iii. Pieris VII. f. 45, 46, ♂;
Voll. Mon. Pier. p. 31, pl. iv. f. 3, ♀.

Hab.—Timor (Coll. Wall. ♂).

This beautiful species evidently belongs to the present group, and seems to come best here. The colouring of the underside is however curiously like *Thyca belisama*, except in the marginal spots being red instead of orange. It may probably be a case of mimicry, like those of *Prioneris* for the same group.

27. *Pieris timnatha*, Hewitson.

Pieris timnatha, Hew. Ex. Butt. vol. iii. Pieris VII. f. 47, 48, ♂;
Voll. Mon. Pier. p. 25.

Hab.—Tondano, N. Celebes (Coll. Wall.).

First variety.—Above: apex of the upper wings blacker, the spots scarcely marked; hind wings without black markings on the

grey border. Beneath: the costa and apex of the uppers darker, the posterior band of the hind wings much broader, and the nervures more widely margined, the submarginal spots very small.

Hab.—Sula Islands (Coll. Wall.).

Second variety.—Above, whiter, nearly like *P. eperia*, the apex dark, with small white linear spots, and a single dark band to the end of the discoidal cell. Beneath, paler, the submarginal band of the hind wings abruptly angular as in *P. eperia*, and the submarginal spots more elongate and nearly white. Female: above, blackish, with white patches between the nervures chiefly in and near the cell; beneath, like the male, but the nervures more broadly dark-margined.

Hab.—Macassar (Coll. Wall.).

The last variety closely resembles *P. eperia* beneath, but the form of the wings is quite different. This seems to be a variable species, and a greater number of specimens would probably present intermediate forms. The Sula Islands are zoologically a part of Celebes, as is well shown by their birds.

28. *Pieris eperia*, Boisduval.

Pieris eperia, Bd. Sp. Gén. p. 470; Voll. Mon. Pier. p. 27.

Hab.—Macassar, Menado (Wall.).

This fine species differs much in form from all its allies, having the abrupt band of the costa and the elongated wings characteristic of many Celebes butterflies. The specimens from Menado are more richly coloured beneath.

29. *Pieris pactolicus*, Butler.

Pieris pactolicus, Butler, Proc. Zool. Soc. 1865, p. 455, pl. xxvi. f. 1, ♂.

Hab.—Borneo (*not* Bogota), (Brit. Mus. Coll.).

This is near *P. coronis* and *P. eperia*, but is quite distinct. By an oversight the habitat is given as “Bogota,” which may easily lead to its being overlooked by persons studying Eastern Lepidoptera.

30. *Pieris coronis*, Cramer.

Papilio coronis, Cr. 44 B, C, ♀. *Pieris coronis*, Bd. Sp. Gén. p. 471.

Hab.—N. India, Hong Kong (Coll. Wall., B. M.).

This species does not seem to vary much in Indian specimens, and I consider Cramer was correct in making the allied forms distinct.

31. *Pieris evagete*, Cramer.

Papilio evagete, Cr. 221 F, G, ♂.

Pieris coronis, part, Bd. Sp. Gén. p. 471.

Hab.—India (Coll. Wall., B. M.).

Cramer's figure well represents the male of this species; the female only differs by having the nervures, especially the median, more dilated, and the colours rather more obscure. It is distinguished from the female of *coronis* by having a row of well-marked submarginal spots on the upper surface of the fore wings, by the yellow colour of the under surface of the hind wings, and by their more rounded outline.

32. *Pieris corva*, n. sp.

Pieris coronis, var. A., Bd. Sp. Gén. p. 472, ♂.

Female.—Has the nervures round the cell of the upper wings much thickened, and the white apical spots obsolete; beneath, as in the male.

Hab.—Java, Baly (Coll. Wall.).

This form has a well-marked character of the under surface which readily separates it from *P. coronis*. It also has a posterior black border, much wider and more defined than in the allied forms.

33. *Pieris zeuxippe*, Cramer.

Papilio zeuxippe, Cr. 362 E, F.

Hab.—S. India.

This seems to be near *P. hira*, Moore.

34. *Pieris hira*, Moore.

Pieris hira, Moore, Proc. Zool. Soc. 1865, p. 490, pl. xxxi.
f. 17.

Hab.—Punjaub, Oude (Coll. Moore).

This is a small distinct species, allied to *P. coronis*.

35. *Pieris copia*, n. sp.

Male.—Above, white; the upper wings with a black border nearly as in *P. hira*, but the apical spots almost obsolete; hind wings with the spots at the end of the nervures of a greyish tint. Beneath, the lower wings and the apex of the uppers pale greenish, the spots of the uppers as in *P. hira*, but fainter; the nervures of the lower wings broadly margined with dusky olive, and a row of small spots of the same colour parallel to the hind margin.

Expanse of wings $2\frac{1}{4}$ inches.

Hab.—Bengal (Coll. Wall. and Moore).

Closely allied to *P. hira*, Moore, which appears to be a small and more highly-coloured form peculiar to West India.

36. *Pieris amba*, n. sp.

Male.—Above, white; upper wings with the base of the costa dusky, and a black patch across the apex curved and crenated internally, not reaching the outer angle; lower wings with a very faint narrow border, forming spots near the outer angle. Beneath: the uppers white, with the costa, apex, and a partially-detached spot, pale ochre-brown; the lower wings entirely ochre-brown, with the subcostal and median nervures and an indistinct band parallel to the hind margin rather darker.

Expanse of wings $2-2\frac{2}{3}$ inches.

Hab.—N. India (Coll. Wall. and Moore).

Allied to *P. copia* and *P. remba*, but distinguished by the nearly uniform pale earthy-brown colour of the underside of its hind wings.

37. *Pieris nama*, Moore.

Pieris nama, Moore, Proc. Zool. Soc. 1857, p. 102 (♂, ♀),
pl. 44, f. 1, 2.

Hab.—N. India (Coll. Wall., B. M.).

A fine distinct species in both sexes.

38. *Pieris remba*, Moore.

Pieris remba, Moore, Cat. Lep. E. I. C. p. 75.

Female.—Above, blackish-brown, a large white patch on the uppers across the end of the cell, and one on the lower wings not

passing the end of the cell, and produced towards the outer angle ; base dusky. Beneath nearly as in the male. (B. M.), Ceylon.

Hab.—Canara (India), Ceylon (Coll. Wall. and Moore).

39. *Pieris nadina*, Lucas.

Pieris nadina, Luc. Rev. & Mag. de Zool. 1852, p. 335.

(Very near *P. nama*, Moore, ? same.)

♂. Upper wings about the same as *P. nama* ; “hind wings with the extremity of the nerves black. Beneath : uppers with a yellow band across the greenish apex ; hind wings with a transverse band of green spots.

“♀. Dusky ; uppers above with two white bands, and a row of yellow spots at the tip ; lower wings also with two white bands, the hind one formed of spots placed between the nervures ; these bands more distinct beneath ; nervures and margins finely black. 52 mill.” (Lucas.)

Hab.—Silhet (also Java?).

Appears distinct by the description, but I have not seen a specimen.

40. *Pieris nesba*, Lucas.

Pieris nesba, Luc. Rev. & Mag. de Zool. 1852, p. 324.

“♀. Fore wings, above, brown-black, with the spaces between the nervures clear grey ; three or four white marks near the apex ; beneath, the same as above, with the spaces and discoidal cell browner, a marginal row of greyish-white spots reaching the hind border. The hind wings sulphur-yellow, with a broad black border, and marginal spots of greyish-white ; beneath, lighter yellow, with a narrower border and larger spots.” (Lucas.)

Hab.—China.

A species which I have not seen, but which probably comes here.

c. *Cynis* group.

41. *Pieris cynis*, Hewitson.

Pieris cynis, Hew. Ex. Butt. vol. iii. *Pieris* VIII. f. 54, ♂.

Female.—Above : upper wings blackish-brown, with a curved band of four white spots, one large at the end of the cell, two smaller below, and one less distinct on the inner margin ; lower wings

whitish, with a dusky border and base, and white fringe. Beneath, as above, but the white marks larger and less sharply defined.

Hab.—Malacca, Mount Ophir (Wall.); Sumatra (Hewits.).

A rare species, with the aspect of an *Elodina*.

d. *Gliciria* group.

42. *Pieris nipalensis*, Gray.

Pieris nipalensis, G. R. Gray, Lep. Ins. Nep. pl. 6, f. 1, 3.

Hab.—N. India, Madras (B. M.); Himalayas, to 10,000 feet altitude (Capt. Lang).

This is the Indian form of *P. brassicæ*.

43. *Pieris ajaka*, Moore.

Pieris ajaka, Moore, Proc. Zool. Soc. 1865, p. 490, pl. xxxi. f. 16.

Hab.—N. W. Himalayas (B. M.); Lower Kunawur (Capt. Lang).

Allied to *P. gliciria*. *Pieris melete*, Ménétries, from Japan, hardly differs from this species.

44. *Pieris gliciria*, Cramer.

Papilio gliciria, Cr. 171 E, F. *Pieris gliciria*, Bd. Sp. Gén. p. 524.

Hab.—N. India, China; Himalayas, to 10,000 feet (Capt. Lang); Philippine Islands (Coll. Wall., B. M.).

The specimens from the Philippines are rather smaller, and have the hind wings less produced at the outer angles, but offer no definite characters to separate them specifically.

45. *Pieris pigea*, Boisduval.

Pieris pigea, Bd. Sp. Gén. p. 523.

Hab.—China.

I have not seen a specimen of this species.

46. *Pieris daplidice*, Linnæus.

Papilio daplidice, Linn. S. N. ii. p. 760. *Pieris daplidice*, Bd. Sp. Gén. p. 544.

Hab.—N. India, "Shipkee, alt. 13,000 feet" (Capt. Lang).

This species hardly enters the Indian region. It is truly Palæ-arctic.

47. *Pieris kalora*, Moore.

Pieris kalora, Moore, Proc. Zool. Soc. 1865, p. 489, pl. xxxi. f. 15.

Hab.—N. W. Himalayas, 15,000 feet elevation (Capt. Lang). Allied to *P. callidice*. A Palæarctic species.

e. *Agathon* group. (*Aporia*, Hübn.)

48. *Pieris agathon*, Gray.

Pieris agathon, G. R. Gray, Lep. Ins. Nepal. pl. 8, f. 1, ♂; Bd. Sp. Gén. p. 447, ♂.

P. phryxe, Bd. Sp. Gén. p. 446; Blanchard, Voy. Jacquemont, Ins. t. 2, f. 1, ♀.

Hab.—N. India (B. M. ♂, ♀).

This curious and isolated form, I think with Mr. Moore, comes next *P. cratægi* and *P. soracta*, which latter has the small yellow spot at the base of the hind wings beneath. The three species agree with each other, and with the true *Pieris*, in all important points of structure; and I can see no reason for separating them generically, although the short hairy palpi perhaps indicate the affinity of this family to the *Papilionidæ*.

49. *Pieris nabellica*, Boisduval.

Pieris nabellica, Bd. Sp. Gén. p. 509.

Hab.—N. W. India, Upper Kunawur (Capt. Lang). (Coll. Moore.)

The affinities of this remarkable species were quite mistaken by Boisduval, who places it along with *P. protomedia* and other African species. It is, however, clearly allied to *P. agathon* and *P. soracta*, but is so coloured as to lead one at first sight to place it near *P. eucharis*, from which group it differs in neuration and other points of structure.

50. *Pieris soracta*, Moore.

Pieris soracta, Moore, Cat. Lep. E. I. C. p. 84.

Hab.—N. India (Coll. Moore, B. M.).

This is evidently close to the European *P. cratægi*, and the

appearance of the yellow spot at the base of the lower wings beneath leads to *P. agathon*, which otherwise appears so different.

(*Pieris hippia*, Bremer, Lep. Öst-Sibriens, tab. iii. f. 1, from East Siberia, is very near *P. soracta*, Moore.)

THYCA, Wallengren.

This genus is well distinguished by having only one subcostal nervure given off before the end of the cell, the first being always absent. The body is comparatively small, the antennæ are generally long and slender, the wings ample, the uppers often much elongated. The larvæ are clothed with long hairs, and the pupæ are spined on the under surface.

This group is preeminently a natural one. It consists of rather large insects, which are adorned with more rich and variegated hues than any other old-world *Pieridæ*; and, like so many other richly-coloured insects, they are found only in the vast forests, which, with few interruptions, spread continuously from the slopes of the Himalayas through Malacca and the Malayan Islands to North Australia and the Pacific. They all fly weakly and slowly, yet they are by no means rare, since in almost every locality I found some of the species very abundant in the forests, flying lazily along near the ground, sometimes settling on a flower, but more generally seeming to wander aimlessly through the pathless recesses of the forest. It is probable, then, that they have some special protection which renders swiftness of motion and the disguise of sombre colours unnecessary, and this seems the more probable when we find that some of them are the subjects of mimicry, as already pointed out in the introduction, and under the genus *Prioneris*.

Thyca appears to be closely related to the American genus *Euterpe*, since it not only agrees in many of its species having a dark ground-colour, but hardly offers any constant structural differences.

I arrange the species under the following groups:—

- a. *Pasithoe* group. Lower wings marked with a red semicircle at their base beneath.
- b. *Belladonna* group. Lower wings with a basal yellow patch.
- c. *Belisama* group. Lower wings with a red spot at the base beneath, between the costal and subcostal nervures.

d. *Hyparete* group. Lower wings beneath with the basal region yellow, and a submarginal band of red, white or yellow spots.

e. *Nysa* group. Lower wings beneath black, yellow-marked at the base, and with yellow submarginal spots.

Note.—The extensive *hyparete* group is further subdivided in the catalogue of species.

a. *Pasithoe* group.

1. *Thyca pasithoe*, Linnæus.

Papilio pasithoe, Linn. S. N. ii. p. 755. *Pieris pasithoe*, Bd. Sp. Gén. p. 451. *Papilio porsenna*, Cr. 43 D, E, ♂; 352 A, B, ♀.

Hab.—India, Silhet (B. M.).

2. *Thyca henningia*, Eschscholtz.

Pieris henningia, Eschsch. Voy. Kotzebue, pl. ix. f. 20 a, 20 b, ♀.

Form of *T. pasithoe*, but the upper wings with the outer margin concave.

Male.—Above, black: upper wings with a bluish-white band formed by a large spot in the cell and two below it as in *T. pasithoe*, but larger and more defined, the outer band of spots and that at the end of the cell absent or very faintly indicated; lower wings with a patch of rich yellow between the cell and the abdominal margin and reaching the second median nervule; a faint bluish-white patch across the cell to the inner margin, no submarginal spots. Beneath: the uppers have a distinct white band across the wings, a spot at the end of the cell and four small linear spots across the apex; the lower wings have the spots rich yellow, disposed as in *T. pasithoe*, but leaving a broader black border, and the outer spots all very small; the red semicircular band is narrower, and does not extend beyond the costal nervule to the margin of wing as in *T. pasithoe*.

Female.—Above, as in the male, but the band across the uppers is whiter and more defined, and the yellow patch of the lower wings is paler and extends into the discoidal cell. Beneath it differs in the same manner from the under surface of the male, every spot and band being the same but rather more developed, and there are five spots instead of four in the apical band.

Expanse of wings: male 3 inches; female $3\frac{1}{2}$ inches.

Hab.—Manilla (Coll. W. W. Saunders).

A beautiful species, closely allied to the Indian *T. pasithoe*.

3. *Thyca pandemia*, n. sp. (Pl. VI. fig. 4, 4a, ♂.)

Upper wings shorter and hind wings more elongated than in *T. pasithoe*.

Male.—Above, black, a white spot at the end of the cell of all the wings, and at the outer angle of the uppers, which have also the costa and a curved band of linear spots across the apex decreasing to the outer angle within which is a linear mark, greyish-white; the lower wings have a rich yellow abdominal patch only just passing the first median nervule, and a faint greyish band from the inner margin across the cell. Beneath: the markings of the uppers as above but more distinct; the lower wings have the yellow spots as in *T. pasithoe*, but smaller and brighter, only the two spots between the cell and the outer row are absent, and the spot in the cell is divided into two; the semicircular red band as in *T. hemingia*, but still narrower.

Expanse of wings $2\frac{5}{8}$ inches.

Hab.—Borneo (Coll. W. W. Saunders, Brit. Mus.).

A beautiful modification of *T. pasithoe*, at once distinguished by the absence of the band across the upper wings.

4. *Thyca egialea*, Cramer.

Papilio egialea, Cr. 189 D, E, ♀; 258 E, F, ♂. *Pieris egialea*, Bd. Sp. Gén. p. 450.

Hab.—Java (Wall.); Sumatra, Biliton, Banca (Voll.).

Vollenhoven in his Monograph of Malayan *Pieridæ* (p. 7) gives also "Ceram" as a locality for this insect, but I have no doubt this is an error, and therefore do not include it among the localities. The whole group to which this species belongs is restricted to the Indian region.

5. *Thyca erithoe*, Boisduval.

Pieris erithoe, Bd. Sp. Gén. p. 450; Voll. Mon. Pier. p. 7, ♂.

Female.—Has the patch on the upper wings whiter, two spots at the end of the cell and those at the apex large and white; on the lower wings the white patch extends only in a narrow prolongation across the end of the cell. Beneath, differs from the male nearly as above, and on the lower wings the yellow patch does not extend so far up the wing, leaving a notched black band between it and the red base.

Hab.—Java (B. Mus. Coll. ♂, ♀).

The bluish patch on the disk of the upper wings is almost obsolete in some specimens.

6. *Thyca thisbe*, Cramer.

Papilio thisbe, Cr. 233 C. *Pieris thisbe*, Bd. Sp. Gén. p. 449, ♀.

Hab.—China.

Boisduval has described an Indian female as the male of Cramer's species, which I consider distinct from that of India. I have not seen specimens.

7. *Thyca pyramus*, Wallace.

Pieris thisbe, G. R. Gray, Lep. Ins. Nepal. p. 8, t. 7, f. 1. (*P. thisbe* ♂, Bd. Sp. Gén. p. 449, is the female.)

Hab.—N. India (Coll. Wall., B. M.).

This differs so much from Cramer's figure that I believe it must form a distinct species. The female has the lower part of the hind wings yellow and a yellow spot within the cell, and beneath, the whole posterior border is yellow, whereas in Cramer's figure and Boisduval's description these parts are white or dusky.

8. *Thyca parthenope*, n. sp. (Pl. VI. fig. 5, 5 a, ♂.)

Male.—Above: form and markings almost exactly as in *T. pasithoe* ♂, but the anal margin is nearly white and the posterior row of spots less distinct. Beneath: upper wings as in *T. pasithoe*; lower wings with the red semicircular band of about the same size and form as in *T. pasithoe*, the markings of the rest of the wing arranged as in *T. pyramus*, except that the yellow colour is paler and extends much further up the wing, filling two-thirds of the discoidal cell.

Expanse of wings $2\frac{3}{4}$ inches.

Hab.—Singapore (Coll. Wall.); Borneo (B. M.).

This insect combines the characters of two very distinct Indian species, but in the Bornean specimen in the British Museum one of the yellow patches beyond the cell is partly divided, showing an approach to the *pasithoe* form.

9. *Thyca ninus*, n. sp. (Pl. VII. fig. 1, ♂.)

Closely allied to *T. pyramus*, Wall. *Male.*—Wings broader uppers more triangular, the outer margin not concave and pro-

duced. Above: upper wings marked nearly as in *T. pyramus*, but the ground colour is blacker, and the basal patches bluer and less elongate; lower wings with the red patch at the base much smaller, not filling one third of the cell, below it a broad transverse bluish-ashy band, paler at the abdominal margin, a large ochre-yellow patch at the anal angle divided into four parts by the nervures; outer angle black, without whitish markings. Beneath, almost exactly as in *T. pyramus*, but the red semicircle does not extend quite so far down, and the posterior markings of the hind wing are more clearly defined and of a nearly uniform ochre-yellow.

Expanse of wings 3 inches.

Hab.—Malacca, Mount Ophir (Coll. Wall.).

This insect differs so clearly in form, size, marking, colouration and locality from its allies, that I have felt obliged to give it a different name, although its general appearance is such that many Entomologists would at once pronounce it "a mere variety." Male specimens only were taken by myself at Malacca.

b. *Belladonna* group.

10. *Thyca belladonna*, Fabricius.

Papilio belladonna, Fab. Ent. Syst. III. i. p. 180; Don. Nat. Repos. pl. 35.

Pieris Horsfieldii, G. R. Gray, Lep. Ins. Nepal. t. 8, f. 2.

Hab.—N. India (Coll. Wall., B. M.).

The specimens vary in size, form and colouration. Some are very black, with the spots smaller, and scarcely a trace of yellow on the abdominal margin above.

The female is brown-black, with the spots yellowish-white. This sex seems very rare, as I have only seen a specimen in the Collection of Mr. Hewitson.

11. *Thyca sanaca*, Moore.

Pieris sanaca, Moore, Proc. Zool. Soc. 1857, p. 103, pl. xlv. f. 4 (err. 6), ♂.

Hab.—Darjeeling (Coll. B. M.).

Female.—Above, pale sulphur-yellow, the dark parts as in the male, but much less diffused; beneath pale yellow-white, the yel-

low spots as in the male, the dark markings less in extent. (B. M. Coll.)

A beautiful and rare species, allied to *T. belladonna*.

12. *Thyca aganippe*, Donovan.

Papilio aganippe, Don. Ins. N. Holl. pl. 29. *Pieris aganippe*, Bd. Sp. Gén. p. 457, ♂.

Female.—Above, pale yellow; the marginal black band broader than in the male and well defined, a row of spots between it and the cell, and a large patch at the end of the cell sometimes connected with the border. Beneath nearly as in the male.

Hab.—Australia (Coll. Wall., B. M.).

It is difficult to locate this common Australian species. The form of its wings and the black under surface of the hind wings, with the basal yellow and red spot, seem to indicate an affinity to *T. belladonna*.

c. *Belisama* group.

13. *Thyca belisama*, Cramer.

Papilio belisama, Cr. 285 A, B, C, D. *Pieris belisama*, Bd. Sp. Gén. p. 464; Voll. Mon. Pier. p. 16.

Hab.—Java, Sumatra (Coll. Wall.).

The colour of the males varies from white to rich cream-colour, and even to orange-yellow, and of the females from cream-colour to ochre-yellow. My Java specimens show these differences.

14. *Thyca sthenobæa*, Boisduval.

Pieris sthenobæa, Bd. Sp. Gén. p. 466.

Hab.—Moluccas ("Coll. de M. Feisthamel").

Boisduval thinks this is near *T. belisama*. The absence of the red spot beneath is however very remarkable, and it may perhaps be more allied to *T. agostina*. I have not seen a specimen, nor is it in the Leyden Museum.

15. *Thyca glauca*, Butler.

Pieris glauca, Butler, Proc. Zool. Soc. 1865, p. 431, pl. xxv. f. 2, ♂.

Hab.—Borneo (B. M.).

A well-marked local form of *T. belisama*.

16. *Thyca Descombesi*, Boisduval.*Pieris Descombesi*, Bd. Sp. Gén. p. 465.*Hab.*—N. India, Cochin-China (Coll. Wall., B. M.).17. *Thyca zebuda*, Hewitson.*Pieris zebuda*, Hew. Ex. Butt. vol. iii. *Pieris* VII. f. 49, 50, ♀.[*P. Descombesii*, Voll. Mon. *Pier.* p. 18.*Hab.*—Celebes (Coll. Wall.).

This species is very distinct from *T. Descombesi*, both in form and colouration of both sexes. The male has the excessively elongated wings so characteristic of the butterflies of Celebes.

18. *Thyca aruna*, Boisduval.*Pieris aruna*, Bd. Sp. Gén. p. 466, ♂; Hew. Ex. Butt. vol. ii.*Pieris* III. f. 20, 21, 22; Voll. Mon. *Pier.* p. 18.*P. bajura*, Bd. Sp. Gén. p. 467, ♀.*Hab.*—Waigiu, Batchian (Wall.); Obi (Voll.); New Guinea (Voy. Coq.).

This is perhaps the most beautiful and remarkable of all the *Pieridæ*, its two sexes presenting four totally distinct surfaces, all finely coloured.

19. *Thyca harpalyce*, Donovan.*Papilio harpalyce*, Don. Ins. N. Holl. pl. 18. *Pieris harpalyce*,
Godt. Enc. Méth. ix. p. 149; Bd. Sp. Gén. p. 458.*Hab.*—Australia, Moreton Bay (Coll. W. W. Saunders, B. M.).One of the handsomest of the *Pieridæ* on the underside.20. *Thyca nigrina*, Fabricius.*Papilio nigrina*, Fab. Ent. Syst. III. i. p. 200. *Pieris nigrina*,
Sw. Zool. Ill. 2 ser. pl. 69; Bd. Sp. Gén. p. 459.*Hab.*—Australia (Coll. Wall., B. M.).

A common species in most parts of Australia.

d. *Hypparete* group.

This extensive group may be subdivided according to details of colouration.

* A band of red spots, the nervures black and dilated beneath.

21. *Thyca hierte*, Hübner.

Papilio hierte, Hüb. Zutr. f. 77, 78.

Papilio antonoe, Stoll. 33, f. 2, 2 b (*nec* Cramer). *Pieris antonoe*,
Bd. Sp. Gén. p. 454.

Hab.—China (Coll. Wall.).

Var. Indica.

Male.—Wings broader than in the type, nervures and apex more dusky. Beneath: the upper wings have the nervures much more broadly dusky, leaving the apical spots smaller and not yellow-tinged; the lower wings have the whole basal and abdominal region rich orange instead of yellow, the marginal spots larger and deeper red, the two inner ones shading into the orange tint.

Hab.—Siam (Coll. W. W. Saunders); India (Coll. Moore).

Female.—Above: upper wings dusky black, with greyish lines in the cell and between the nervures, and a band of six linear spots across the apex; lower wings with the nervures broadly dusky, the discoidal cell and the abdominal margin nearly white. Beneath: the uppers black, with the spaces between the nervures whiter than above, and the upper spots of the apical band orange-tinged; the hind wings nearly as in the male, with the orange colour extending farther towards the outer angle, and the red marginal spots all well defined.

Hab.—Burmah (Coll. Moore).

In the British Museum Collection are a series of specimens from various parts of tropical Asia, no two of which are exactly alike, and which show that, though the extreme forms are well marked, they are connected by such a series of completely intermediate forms that it is impossible to define them.

22. *Thyca eucharis*, Drury.

Papilio eucharis, Drury, Ins. ii. t. 10, f. 5, 6; Cr. 201 B, C,
202 C (*nec* Fab.).

Papilio hyparete, Fab. Ent. Syst. III. i. p. 178 (*nec* Linn.).

Pieris epicharis, Godt. Encl. Méth. ix. p. 153; Bd. Sp. Gén.
p. 456.

Hab.—North and N. W. India (Coll. Wall., B. M.).

A very common species in collections.

23. *Thyca hyparete*, Linnæus.

Papilio hyparete, Linn. S. N. ii. p. 763; Clerck, Icon. t. 38, f. 2, 3 (*nee* Fab.). *Pieris hyparete*, Bd. Sp. Gén. p. 455; Voll. Mon. Pier. p. 9.

Papilio antonoe, Cr. 187 C, D, 320 A, B.

Hab.—Java, Borneo, Singapore (Wall.); Sumatra (Voll.).

This species presents slight but apparently permanent differences in each locality. Taking those of Java as the type, the Singapore form has a narrower black border to the hind wings, the outer red spot is wanting beneath, the three inner red spots are much larger, and the anal margin is of a deeper yellow colour. The Borneo form has no black hind border but a broad ashy one, while beneath it is intermediate between the preceding and the type. Both however are larger, and have more elongate wings than the Java specimens.

Vollenhoven gives "Ceram" as another locality, but this is evidently an error.

24. *Thyca luzoniensis*, Felder.

Pieris luzoniensis, Feld. Wien. Ent. Monats. vi. p. 285.

Hab.—Luzon, Philippines (Coll. Wall., B. M.).

"A geographical form of *P. hyparete*" (Feld.). This has broader wings than the other forms, but is hardly more distinct than those of Sumatra or Borneo.

25. *Thyca Rosenbergii*, Vollenhoven.

Pieris Rosenbergii, Voll. Mon. Pier. p. 11, pl. 2, f. 6; pl. 3, f. 1.

P. Lorquini, Feld. Voy. Novara, p. 159, t. xxiv. f. 9, 10.

Hab.—Celebes, Macassar (Wall.); Menado (Voll.).

A most beautiful and distinct species, excelling all others of this sub-group as those of Celebes so often excel their allies. Dr. Felder's name for this species is, I believe, of a later date than Vollenhoven's, though the two publications are of the same year.

26. *Thyca hæmorrhœa*, Vollenhoven.

Pieris hæmorrhœa, Voll. Mon. Pier. p. 10, pl. 2, f. 5, ♂.

Hab.—Banca (Leyden Mus.).

This very interesting species shows that the little island of Banca, though separated by a narrow strait only from Sumatra,

yet possesses its peculiar species of insects as it does of birds and mammals.

* * Submarginal band beneath the lower wings white ; nervures black and dilated.

27. *Thyca agostina*, Hewitson.

Pieris agostina, Hew. Ex. Butt. vol. i. *Pieris* I. f. 1, 2, ♂.

Female.—Above : upper wings black, with ashy patches in the cell and between the nervures, and a row of elongate white spots near the outer margin ; lower wings pale ochre-yellow, black-bordered behind, with a marginal row of ashy spots, and the nervures slightly margined with dusky atoms. Beneath as above, but the markings on the upper wings whiter and more defined, the lower wings bright ochre-yellow.

Hab.—North India (Coll. Hewitson and Moore).

28. *Thyca blanca*, Felder.

Pieris blanca, Feld. Wien. Ent. Monats. vi. p. 284.

Hab.—Luzon, Philippines.

This species seems to me nearer to *T. agostina* than to *T. themis* (with which Felder allies it), on account of the black-bordered veins of the upper wings beneath, which I think is a good character for arranging the species in a natural series.

29. *Thyca singhapura*, n. sp. (Pl. VII. fig. 2, ♂.)

Male.—Wings elongate ; above, white, the costal margin and the outer half of the uppers dusky, nearly black at the apex, and with an ill-defined inner edge ; lower wings with a narrow interrupted black border behind, within which dusky patches of scales extend a short distance along the nervures. Beneath : upper wings white, the nervures of the upper half black-margined, the apex blackish, leaving a row of six distinct ovate white spots ; lower wings bright yellow, the nervures black-bordered, and a rather broad black border round the hind margin enclosing a row of six whitish spots, the inner ones bifid, the outermost yellow-tinged.

Expanse of wings $3\frac{1}{8}$ inches.

Hab.—Singapore (Coll. Wall.).

* * * Beneath with nervures not black or dilated, submarginal posterior band red and white, or white.

30. *Thyca argenthona*, Fabricius.

Papilio argenthona, Fabr. Ent. Syst. III. i. p. 200, ♀.

Pieris protochiris, Bd. Sp. Gén. p. 457, ♀.

Male.—Above, like the female, but white instead of yellow, the apical and posterior bands narrower, margined within with an ashy tint. Beneath the same difference of tint and markings.

Hab.—Australia (Coll. Wall., B. M.).

31. *Thyca peribæa*, Godart.

Pieris peribæa, Godt. Enc. Méth. ix. p. 154; Bd. Sp. Gén. p. 453; Voll. Mon. Pier. p. 8.

Hab.—Java (Leyden Mus.).

This species has its affinity with *T. argenthona*, rather than near *Prioneris philonome*, where Boisduval places it, or near *T. hyparete*, according to Vollenhoven. The absence of black on the veins beneath and the white-bordered red spots indicate this.

32. *Thyca themis*, Hewitson.

Pieris themis, Hew. Ex. Butt. vol. ii. *Pieris* V. f. 31, 32, ♂.

Female.—Has the base dusky, the apical half of the uppers and a broad margin on the hind wings black, enclosing a few faint yellowish spots; the disc of the hind wings is pale yellow. Beneath, nearly as in the male, but with the black apex and hind margin rather wider, and the disc of the hind wings deeper yellow.

Hab.—Philippine Islands (Coll. Hewitson).

On the whole, I consider this species nearest to *argenthona*, with which it agrees in having the veins not black-bordered beneath, and a somewhat similar distribution of black and yellow on a white ground, the posterior band of spots being white instead of red.

* * * * White with a black border in both sexes, nervures not black and dilated beneath, posterior band yellow or white.

33. *Thyca gabia*, Boisduval.

Pieris gabia, Bd. Sp. Gén. p. 478, ♂; Voll. Mon. Pier. p. 38, ♀.

Eab.—Waigiou (Voy. Coquille); New Guinea (Voll.).

A rare species, which I did not myself meet with, and of which I have not seen a specimen.

34. *Thyca dice*, Vollenhoven.

Picris dice, Voll. Mon. Pier. p. 39, pl. 4, f. 7.

Hab.—New Guinea, Waigiou (Voll.).

Another closely allied species of this group, not in the English collections.

35. *Thyca ennia*, n. sp. (Pl. VII. fig. 4, ♂, ♀.)

Male.—Above, white, upper wings with the costa dusky, and a black border at the apex regularly curved within, enclosing two small white spots and terminating in a point at the outer angle; lower wings with a narrow hind border, not reaching the outer angle. Beneath: a row of five apical spots, the two uppermost of which are largest and yellow, the base of the lower wings yellow-tinged, and the hind border enclosing a line of narrow yellow spots.

Female.—Above, white, with a much broader dusky border to the anal angle, the base of the uppers dusky, and a band at the end of the cell connecting the costa with the outer border. Beneath, there is a band of six spots near the outer margin of the uppers, the second and third being larger and yellow; the base of the wings, the anal margin, and several marks between the nervures, are also yellow; the posterior band is much broader, its inner margin straight and just beyond the end of the cell, and has a submarginal row of six horizontal yellow spots.

Expanse of wings $2\frac{3}{8}$ — $2\frac{5}{8}$ inches.

Hab.—Waigiou (Coll. Wall.).

This is very near *T. dice*, which seems intermediate between this and *T. gabia*. It is curious that all should be found in the same small island. The upper side of *T. dice* is, according to Vollenhoven's description, like my male, and the under side like my female.

* * * * * Females very dark, posterior band beneath red, nervures not black or dilated.

36. *Thyca bagoe*, Boisduval. (Pl. VII. fig. 3, 3 a, ♂, ♀.)

Pieris bagoe, Bd. Sp. Gén. p. 461, ♀.

Male.—Above, white; uppers with the costal margin and apex and a band from the costa to the middle of the outer margin,

black, leaving four white apical spots formed by the transverse nervures; lower wings white, with a very narrow border behind. Beneath: upper wings nearly as above; lower wings rich yellow at the basal and anal margins, and a rather broad black band behind, enclosing a row of six vermilion-red spots hardly separated by the nervures; the second and third spots from the anal angle are much the largest.

Expanse of wings 3 inches.

Hab.—Aru Islands (Wall. ♂, ♀); New Ireland (Voy. Coquille).

A fine species, commencing a series with dark females.

37. *Thyca mysis*, Fabricius.

Papilio mysis, Fab. Ent. Syst. III. i. p. 200. *Pieris mysis*, Godt. Encyc. Méth. ix. p. 150; Bd. Sp. Gén. p. 460, ♂.

Female.—Above: base of the wings tinged with yellow, marginal bands broader, and a row of five spots at the apex. Beneath: basal half of the wings yellow-washed, and the two upper apical spots yellow.

Hab.—Australia (Coll. Wall.).

38. *Thyca cruentata*, Butler.

Pieris cruentata, Butl. Proc. Zool. Soc. 1865, p. 455, pl. xxvi. f. 2. *P. mysis*, var. *lara*, Voll. Mon. Pier. p. 12.

Hab.—Mysol (B. M.); New Guinea (Leyden Mus.).

39. *Thyca pæcilca*, Vollenhoven.

Pieris pæcilca, Voll. Mon. Pier. p. 13, pl. 3, f. 3, ♂.

Hab.—Gilolo, Morty (Voll.); Batchian (Coll. Wall.).

My specimens from Batchian seem so near Vollenhoven's that I do not like to separate them. The red band beneath is broader in my insects, contains an additional small spot at each end, and melts into the orange tint of the anal angle. The female agrees more closely.

40. *Thyca candida*, Vollenhoven.

Pieris candida, Voll. Mon. Pier. p. 11, pl. 3, f. 2, ♂.

Hab.—Batchian (Leyden Mus.).

Vollenhoven places this species in the *hyparete* subdivision, but I think its affinities are with the *mysis* subdivision, on account of the

absence of thickened nervures beneath the anterior wings. It is not impossible that *T. herodias* from Gilolo may be the female of this, as many of the species of these two islands are identical.

41. *Thyca herodias*, Vollenhoven.

Pieris herodias, Voll. Mon. Pier. p. 14, pl. 3, f. 4, ♀.

Hab.—Gilolo (Leyden Mus.).

This curious form seems quite distinct from *T. pœcilea*, although very closely allied to it.

42. *Thyca timorensis*, Boisduval.

Pieris timorensis, Bd. Sp. Gén. p. 459, ♂; Voll. Mon. Pier. p. 12.

P. vishnu, Moore, Cat. Lep. E. I. C. pl. II a, fig. 5, ♀.

Hab.—Timor (Coll. Wall.).

This fine species appears to be best placed near *T. mysis*, from which it chiefly differs in the great extent of the black border. It is, however, equally closely allied to *T. isse*.

43. *Thyca philyra*, Godart.

Pieris philyra, Godt. Enc. Méth. ix. p. 150; Bd. Sp. Gén. 462; Voll. Mon. Pier. p. 15.

Papilio hyparete, Cr. 210 A, B, 339 E, F (*nec* Linn.).

Hab.—Amboina, Ceram (Coll. Wall., B. M.).

Vollenhoven says the females from *Sumatra* "have no black palmated patch on the lower wings beneath, but only the black nervures dilated." This agrees with Cramer's figure and with my specimen from *Amboina*. I have no hesitation, therefore, in considering the former locality as an error, more especially as the collector's name is not given.

44. *Thyca philotis*, n. sp. (Pl. VIII. fig. 4, ♂.)

Very near *T. philyra*, but with many points of difference, as follows:—

Male.—Above, the apical patch is much larger and the posterior border rather wider and not so clearly defined. Beneath: the boundary of the black colour on the upper wings is in a totally different line, passing across the end of the cell to a little above the outer angle, and leaving a large patch of white between it and

the cell; the base of the wing is purer yellow; on the lower wings the boundary between the black and yellow portions is nearer the base of the wing, the marginal red spots are smaller, and there is only a small detached portion in the cell.

Female.—Above: the basal portion of the wings is nearly pure creamy-white, and there is a row of small indistinct white spots along the hind margin. Beneath: the yellow colour of the base of the upper wings extends downwards, changing to white at the lower margin and touching the outer angle; the lower wings are almost exactly like those of *T. philyra* ♂, except that the red spots are rather broader and extend higher up near the abdominal margin. Size the same as of large specimens of *T. philyra*.

Hab.—Bouru (Coll. Wall.).

This is a beautiful local modification of *T. philyra* in an adjacent island.

45. *Thyca duris*, Hewitson.

Pieris duris, Hew. Ex. Butt. ii. *Pieris* V. f. 34, ♂.

Hab.—Ceram (Wall.).

This rare and very distinct species comes nearest to *T. philyra*. The female is unfortunately not known.

46. *Thyca isse*, Cramer.

Papilio isse, Cr. 55 E, F, 339 C, D. *Pieris isse*, Bd. Sp. Gén. p. 462; Voll. Mon. Pier. p. 14.

Hab.—Amboina, Ceram (Coll. Wall., B. M.).

An abundant species in the forests of these two islands.

47. *Thyca echo*, n. sp. (Pl. VIII. fig. 3, ♀.)

Very near *T. isse*, but with many points of difference, as follows:—

Male.—Above, the apical border of the upper wings is much wider, but does not extend so far towards the outer angle, it contains two minute white dots; the posterior margin of the hind wings is also broader and entirely black. Beneath: the disc of the upper wings is white, faintly yellow-tinged at the base, the spots at the apex are smaller, and the black border is quite differently shaped, curving from the costa at the end of the cell to about the middle of the outer margin; the lower wings are two-

thirds black, and one-third yellow, the division not being clearly defined as in *T. isse*.

Female.—Above: basal half of the wings pale yellow, the rest black without apical spots; beneath, the apical spots are very small, the black border of the uppers is shaped nearly as in the male, the part near the outer angle being white; the lower wings have the black extending a little further up, the band of orange spots very small, and the anal angle rich orange. Size the same as *T. isse*.

Hab.—Bouru (Coll. Wall.).

This species differs from *T. isse* in almost exactly the same points that *T. philotis* differs from *T. philyra*,—a very curious fact in connexion with the laws of variation, since it shows a definite modifying influence in particular localities, which effects the same changes in distinct species. I may remark also that in both cases the hind wings of the Bouru forms are more elongate than those of Ceram and Amboina.

* * * * * Beneath: upper wings black, lower wings yellow, nervures not dilated.

48. *Thyca chrysomelæna*, Vollenhoven.

Pieris chrysomelæna, Voll. Tijd. voor Ent. 1866, p. 57, pl. i. f. 12.

Hab.—Kaioa Island (Moluccas). (Leyden Mus.)

This very beautiful species will come at the head of the *dorimene* subdivision, and is most nearly allied to *T. echidna*. It was obtained by the late Herr Bernstein in a small island, where I had myself captured several new species of *Colcoptera*, but, perhaps owing to the time of year, very few *Lepidoptera*.

49. *Thyca echidna*, Hewitson.

Pieris echidna, Hew. Ex. Butt. vol. ii. *Pieris* V. f. 35, 36.

Hab.—Ceram (Coll. Wall.).

I obtained only a single specimen of this distinct and beautiful species in the island of Ceram.

50. *Thyca hippodamia*, n. sp. (Pl. VIII. fig. 1, ♂.)

Male.—Above, white, the colours of the under surface showing

through; a narrow black border on the costal, outer, and hind margins; near the apex of the upper wings are four or five white spots, formed by a dusky transverse band from the outer margin, which does not reach the costa, and is crossed by black nervures; base of the wings dusky. Beneath: upper wings uniform black, with an apical band of five white spots; lower wings rich chrome-yellow, paler on the upper margin, with a rather broad black border, in which is a marginal row of white spots tinged with yellow.

Expanse of wings $2\frac{1}{2}$ inches.

Hab.—Aru Islands (Coll. Wall.).

A species which connects the preceding with *T. dorimene*, which has hitherto appeared completely isolated.

51. *Thyca dorimene*, Cramer.

Papilio dorimene, Cr. 387 C, D. *Pieris dorimene*, Bd. Sp. Gén. p. 464; Voll. Mon. Pier. p. 16.

Hab.—Ceram, Amboina (Coll. Wall., B. M.).

This pretty species is not uncommon in the forests of these islands.

52. *Thyca dorylæa*, Felder.

Pieris dorylæa, Feld. Voy. Novara, p. 182, ♀.

Hab.—Aru Islands (Coll. Felder).

A distinct form, allied to *T. dorimene*. Dr. Felder obtained it in an old Dutch collection. The locality may therefore be erroneous, though it is a probable one.

e. *Nysa* group.

53. *Thyca momea*, Boisduval.

Pieris momea, Bd. Sp. Gén. p. 477; Voll. Mon. Pier. p. 31.

Hab.—Java (Coll. Wall., B. M.).

54. *Thyca nysa*, Fabricius.

Papilio nysa, Fab. Ent. Syst. III. i. p. 195. *Pieris nysa*, Bd. Sp. Gén. p. 476, ♂, ♀.

Hab.—Australia (Coll. Wall., B. M.).

55. *Thyca lanassa*, Boisduval.*Pieris lanassa*, Bd. Sp. Gén. p. 477.*Hab.*—Australia ("Paris Museum").

This appears to be near *T. nysa*. I have not seen a specimen, and it seems a rather doubtful species.

56. *Thyca orphne*, n. sp. (Pl. VIII. fig. 2, ♂.)

Form of the *Aspasia* group of *Pieris*. *Male*.—Above, white, with the base dusky; upper wings with a narrow black border from the apex to near the outer angle, the costa dusky, as well as the extremity of the cell, and a broad marginal band beyond as if smeared with black; the lower wings have a very narrow dusky edging behind. Beneath: the uppers have the base dusky, a broad patch at the end of the cell nearly black, and a broad dusky outer margin, enclosing a row of six white spots, the two lower the largest; lower wings black, but nearly covered with chrome-yellow, which covers the whole abdominal margin to the middle of the wing, beyond which are three large oval spots near the outer angle; another band of yellow crosses the lower half of the cell, and reaches up to the inner margin near the base of the wing.

Expanse of wings $2\frac{3}{8}$ inches.

Hab.—Malacca (Mount Ophir) (Coll. Wall.).

This curious species is rather difficult to locate. Its neurulation shows it to belong to the genus *Thyca*, and it seems best placed near *nysa* and *momea* on account of its black under wings beneath, although the amount of yellow with which it is adorned gives it a different aspect.

57. *Thyca georgina*, Felder.

Pieris georgina, Feld. Wien. Ent. Monats. v. p. 298; Voy. Novara, tab. xxiv. f. 4, 5.

Hab.—Luzon, Philippines (Coll. Felder).

Judging by the form of the wings and the style of colouration, this species is allied to *T. orphne*, and comes in the *nysa* group.

TACHYRIS, n. g.

Head moderate, palpi long, acutely pointed; antennæ of moderate length, terminating in a slender club; thorax stout; abdo-

men slender. Anal valves of the male elongated and provided with a tuft of long and stiff hairs at each side at the base beneath, as shown in the accompanying figures, compared with the same part in allied genera:—



Fig 1.



Fig 2.



Fig 3.



Fig 4.

1. *Tachyris nathalia*, Felder.
2. *Tachyris nero*, Fabricius.
3. *Pieris agathon*, Gray.
4. *Pieris teutonia*, Fabricius.

Upper wings with the apex acute or much produced, two subcostal nervules given off before the end of the cell, the third of moderate length or very short, and in some species quite wanting; upper radial as a branch of the subcostal at some distance beyond the cell. Sexes often differing widely. Larva hairy, and with four or six longitudinal rows of spines; pupa with two lateral spines.

This genus does not differ materially in neururation from *Pieris*, but the remarkable character of the strong tufts of hair at the anal valves of the males enables us to bring together a number of allied forms, which, whenever the male sex is obtained, can be referred to the genus with the greatest certainty. It is restricted to the tropics, but comprises species from all the great divisions of the globe, and is particularly abundant in the Indian and Australian regions, comprising more than fifty species. The African species *sylvia*, Fab., and *eudoxia*, Drury, belong to this genus, and a few others allied to them; while in South America, *margarita*, Hübner, and several closely-allied species, appear to be its only representatives. In the Malay Archipelago, besides a host of species which present the usual white or yellow tints of the family, it contains others whose rich hues of cinnabar-red, orange, and greyish-blue, are altogether peculiar. Most of the species fly swiftly, and many of the males assemble in troops about wet places and on river margins, after

the manner of the genus *Callidryas*. The Eastern species may be conveniently arranged in the following groups:—

- a. *Panda* group. Male white or yellowish, fore wings elongated acute; female dark-bordered, wings more rounded.
- b. *Liberia* group. Male bluish or dark brown, fore wings acute; female dusky, or white and black.
- c. *Nero* group. Male red or orange, fore wings acute; female dusky.
- d. *Pandione* group. Broader, colours white and black; lower wings beneath dusky irrorated, with a spot on the disco-cellular nervule.
- e. *Polisma* group. Wings broad, delicate, white and black, not irrorated beneath; discoidal cells short.

a. *Panda* group.

1. *Tachyris Hombronii*, Lucas.

Pieris Hombronii, Luc. Rev. et Mag. de Zool. 1852, p. 325;
Voll. Mon. Pier. p. 5, pl. 2, f. 3, ♀.

Hab.—Northern Celebes (Coll. Wall.).

This very fine species must come into the present genus, although at first sight it resembles *Thyca hyparete* and its allies. The species to which it is most closely allied is *Tachyris lynceola* (which inhabits Timor), of which it may be considered a large and modified form. It possesses the characteristic abrupt curvature near the base of the fore wings which is found in so many of the Celebes butterflies. (See Trans. Linn. Soc. xxv. pp. 14—19.)

2. *Tachyris cardena*, Hewitson.

Pieris cardena, Hew. Ex. Butt. vol. ii. *Pieris* III. f. 17, 18;
Voll. Mon. Pier. p. 25.

Pieris hagar, Voll. Mon. Pier. p. 38, pl. 4, f. 6.

Hab.—Malacca, Borneo, Sumatra (Coll. Wall.).

My specimens are intermediate between Hewitson's and Vollenhoven's figures, and I have no doubt but that they represent

one rather variable species. It is somewhat aberrant in this group, but serves to connect *T. hippo* and *ada* with *T. nerissa*.

3. *Tachyris nerissa*, Fabricius.

Papilio nerissa, Fab. Ent. Syst. III. i. p. 192. *Pieris nerissa*, Bd. Sp. Gén. p. 535, ♂.

Papilio zelmira, Cr. 320 C, D, E, F. *Pieris zelmira*, Bd. Sp. Gén. p. 533, ♀.

Hab.—Indian Peninsula, Philippine Islands (Coll. Wall., B. M.).

The male is pretty constant and is well described by Boisduval. The female is very variable, some specimens being nearly white, with dusky costa, apex and connecting band, and the markings beneath, nearly obsolete; others are dusky brown, with patches on the upper and lower wings and submarginal spots white or buffy-white, while beneath they are richly banded and margined with chrome-yellow on a white and dusky ground. Innumerable varieties connect these extremes. The Philippine specimens are smaller, and the posterior band of the lower wings beneath crosses at the end of the cell. The markings of the under side of the male are sometimes nearly obsolete.

(*Pieris larissa*, Feld. Voy. Novara, p. 166.

Hab.—Unknown.

Is this not *amasene*, Cr., from China?)

4. *Tachyris lynceola*, Felder.

Pieris lynceola, Feld. Voy. Novara, p. 164, ♂.

Female.—Above, blackish-brown; upper wings with an oblong white patch notched exteriorly, situate below the cell and the second median nervule, and two small ovate white spots (the upper much the largest) just beyond the end of the cell towards the apex of the wings; lower wings with a large ill-defined white patch, occupying the disk of the wing and reaching the anterior and anal margins. Beneath, pearly white, with a broad rusty-brown border, and the two subapical spots rather larger and more diffused; there is also a faint yellowish longitudinal stripe in the discoidal cell of the uppers.

Expanse of wings $2\frac{1}{4}$ — $2\frac{3}{8}$ inches.

Hab.—Timor (Coll. Wall.).

This differs very little from *T. lynceida* in the male, while the female is widely different.

5. *Tachyris lyncida*, Cramer.*Papilio lyncida*, Cr. 131 B, ♂.*Pieris enyo*, Bd. Sp. Gén. p. 481, ♂.*Pieris hippo*, var., Voll. Mon. Pier. p. 42, ♀.*Hab.*—Flores, Lombock, Baly, Java (Coll. Wall., B. M.).

The Java males vary somewhat, but are often undistinguishable from those of Baly and Lombock. For some time I considered *T. lynceola*, Feld., to be Cramer's *lyncida*, and described this as a new species:—

Male.—Above, like *T. lynceola* ♂, but the black border narrower, not enclosing the oval white apical spot, which is larger and bounded above by the powdery white costal band; on the hind wings the border is very narrow and vanishes before reaching the anal angle. Beneath, differs from *T. lynceola* in the same way as above, and has the margin of a paler brown. Larger and has rather more pointed wings than *T. lynceola*.

Female.—Varies much, but agrees well with the species described by Boisduval as *Pieris hippo* (Sp. Gén. p. 534), except that it is tinged beneath with pearly ash, with scarcely any yellow. The upper surface is sometimes rich ashy-brown, with only narrow stripes of pale yellow.

Expanse of wings varies from 2 to $2\frac{3}{4}$ inches.

6. *Tachyris lycaste*, Felder.*Pieris lycaste*, Feld. Voy. Novara, p. 164, ♂.

Male.—Wings elongate, narrowed at the apex. Above, white, costa black-edged and dusky towards the base; outer edge of the uppers concave, with a narrow toothed blackish border not reaching the outer angle; lower wings with a very narrow black edging only near the outer angle. Beneath, white, the lower wings faintly tinged with ochreous-yellow, with a narrow yellow edging at the base; the margins as above, and a rather broad costal band pale brown.

Female.—Above, like *T. hippo*. Beneath, paler, lower wings pearly-ash, with a faint posterior marginal band, and the costal and subcostal nervures light brown.

Expanse of wings ♂ $2\frac{3}{4}$, ♀ $2\frac{5}{8}$ inches.

Hab.—Celebes (Coll. Wall.).

I had described this species before I received Dr. Felder's work. He was not acquainted with the female.

7. *Tachyris formosana*, Wallace.

Pieris formosana, Wall. Proc. Zool. Soc. 1866, p. 356.

Hab.—Formosa (Coll. Wall.); Siam (Coll. W. W. Saunders).

This species has the lower wings of the male beneath edged and washed with yellow, showing a beautiful transition from the preceding species to *T. hippo* and *T. ada*. A specimen from Siam in Mr. W. W. Saunders' Collection agrees closely with this, and one in the British Museum (locality unknown) has a pale sulphur-yellow tint spreading over most of the surface of the wing.

8. *Tachyris andrea*, Eschscholtz.

Pieris andrea, Esch. Voy. Kotzebue, pl. x. f. 23 a, b, ♂.

Female.—Above, dusky, the uppers with two white oval spots at the end of the cell as in the Timor form, and three elongate patches separated by the median nervules; the lower wings with a diffused discoidal white band. Beneath, as in the Timor specimens, but the posterior band is rather wider, and the costa of the hind wings has a margin of rich yellow, which is enlarged at the outer angle, where it joins the dark band.

Hab.—Philippine Islands (Coll. Wall., W. W. Saunders ♀).

The male figured by Eschscholtz has very elongated and pointed fore wings.

9. *Tachyris hippo*, Cramer.

Papilio hippo, Cr. 195 B, C, ♀. *Pieris hippo*, Bd. Sp. Gén. p. 534; Voll. Mon. Pier. p. 42.

Papilio phryne, Fab. Ent. Syst. III. i. p. 196, ♂.

Pieris cleonora, Bd. Sp. Gén. p. 481.

Hab.—N. India, Ceylon, Singapore, Sumatra, Philippine Islands (Coll. Wall., B. M.).

This species is distinguished from its allies by the clear ochre-yellow colour of the under surface of the lower wings in both sexes. A female from N. India in Mr. Moore's Collection has the wings coloured nearly as in the male, except that the apical spot is absent; the under side of the hind wings is ochre-yellow. The Ceylonese specimens are more richly coloured beneath.

10. *Tachyris enarete*, Boisduval.

Pieris enarcte, Bd. Sp. Gén. p. 480, ♂; Guér. Voy. Favorite, pl. ii. f. 1.

Hab.—Borneo (Coll. Wall.).

Well described by Boisduval, who gives "Moluccas" as the

locality on the authority of M. Feisthamel. This is doubtless an error, as I took it in Borneo, and it is so closely allied to the *T. hippo* of Malacca and Sumatra.

11. *Tachyris scyllaria*, MacLeay.

Pieris scyllaria, MacLeay, King's Australia, p. 459; Bd. Sp. Gén. p. 482.

Hab.—West Australia.

I have not seen a specimen of this species.

12. *Tachyris ada*, Cramer.

Papilio ada, Cr. 363 C, D, ♂. *Pieris ada*, Bd. Sp. Gén. p. 479; Voll. Mon. Pier. p. 41, pl. 5, f. 3, ♀.

Pieris cilla, Feld. Voy. Novara, p. 165.

Hab.—Bouru, Ceram, Amboina, Mysol, Aru Islands, New Guinea (Coll. Wall.).

This fine species scarcely differs in all the above localities where I myself captured it. Boisduval describes the male well, but errs as to the female, which he had probably never seen. This is well described and figured by Vollenhoven.

Dr. Felder describes the Aru form as a distinct species, and it certainly presents more marked differences than those of the other localities; some specimens from Bouru and Ceram approach it very closely, but it is generally larger in size, and in both sexes has much more and deeper coloured rich orange tint in the abdominal region beneath; there is also a pale or nearly white spot near the outer angle; yet these differences seem hardly definite enough to characterize a species.

13. *Tachyris clavis*, n. sp.

Male.—Differs from *T. ada* only by the rather broader posterior band of the hind wings both on the upper and under surfaces.

Female.—Above, differs from *T. ada* in the ground colour being white, not at all tinged with yellow or green, but rather bluish, and with a violet shade across the base of the upper and the middle of the under wings, and in the borders being much broader, of a browner colour, and less dentated. Beneath, there are similar differences, the chief being the much larger posterior border on the hind wings, and the basal half being entirely yellow, with

orange patches near the anal and outer angles. Size the same as *T. ada*.

Hab.—Ké Island (Coll. Wall.).

The female of this form differs so strikingly in appearance from that of *T. ada*, which is nearly constant through a wide range of localities, that I am induced to separate it, although, like the various forms allied to *T. hippo*, the differences are not such as are usually considered to be specific.

14. *Tachyris abnormis*, n. sp. (Pl. VIII. fig. 5, ♀.)

Female.—Fore wings with the outer margin more rounded than in the female of *T. ada*. Above, pearly white, the body and adjacent parts of the wings with a faint greenish tinge; upper wings with the costal margin dusky, and a large subtriangular apical patch extending from the middle of the costa to the outer angle blackish-brown; lower wings with a border of the same colour, widest at the outer angle and not reaching to the anal angle. Beneath, upper wings as above, with the base ochre-yellow, and a small elongate patch of cinnabar-red, situate half way down the cell close to the subcostal nervure; under wings entirely brown-black, the base tinged with ochreous-yellow, which extends a short distance along the costal and anal margins.

Expanse of wings $2\frac{3}{4}$ inches.

Hab.—New Guinea (N. W. extremity) (Coll. Wall.).

This very remarkable species appears to come best here. In colouration it bears a striking general resemblance to the beautiful nymphalideous butterfly, *Mynes Geoffroyi*, which inhabits the same country.

15. *Tachyris panda*, Godart.

Pieris panda, Godt. Enc. Méth. ix. p. 147; Bd. Sp. Gén. p. 485; Voll. Mon. Pier. p. 44.

Pieris sulphurea, Voll. Mon. Pier. p. 32, pl. 4, f. 4, ♀.

Hab.—Java, ♂, ♀, B. M. (Horsfield).

This species appears to be confined to the island of Java. It is well described by Godart and Boisduval, and there can be no doubt that Vollenhoven's *sulphurea* is the female, and the locality, "Moluccas," which he gives from Reinwardt, an error. It is represented in the other western islands and in Celebes, by *T. nathalia*, Feld., which also occurs in Java, most likely inhabiting a separate district in that island.

16. *Tachyris nathalia*, Felder.

Pieris nathalia, Feld. Wien. Ent. Monats. vi. p. 285.

Hab.—Java, Singapore (♂, ♀), Sumatra, Borneo, Celebes (♂), Philippine Islands (♂) (Coll. Wall.).

Male.—Above, creamy white with a faint greenish tinge; upper wings with the costal and outer margins narrowly black-bordered, and the apex somewhat dusky. Beneath, bright ochre-yellow; all but the apex and basal part of the uppers much paler or whitish, costal and outer margins finely black-edged. Head and neck olivaceous, thorax and abdomen ashy. The specimens from Celebes are paler and have a much narrower dark border. Those from the Philippines have a rather broader border, and a narrow one on the hind wings.

Expanse of wings $2\frac{1}{2}$ inches.

Female.—Above, sulphur-yellow; upper wings with the basal third dusky; a black border from near the base of the uppers to the anal angle of the lower wings broader on the uppers and enlarged at the apex, its outline toothed within near the outer angle of the lowers. Beneath, upper wings with a black-curved band from the middle of the costa to the outer angle, the disc sulphur-yellow, the base deep yellow, the apex light violet-ash with a yellow margin; lower wings pale ochre-yellow, with a faint violet tinge, with a narrow border of rich yellow from the base to the anal angle.

Expanse of wings $2\frac{3}{8}$ inches.

A specimen from Singapore and one from Java exactly agree with this description. It also exactly agrees with Vollenhoven's figure and description of *sulphurea* (*T. panda*, ♀), except in possessing the narrow border of bright yellow beneath. Some Singapore specimens are very pale yellow above, and have the lower wings tinged with ochre-yellow beneath. Dr. Felder's description of the male refers to a Malacca specimen; the Philippine form having a distinct border to the hind wings, and a dusky patch near the outer angle of the fore wings beneath, is almost sufficiently distinct, in such a group as this, to deserve a separate name.

17. *Tachyris paulina*, Cramer.

Papilio paulina, Cr. 110 E, F, ♀.

Catophaga leis, Hübn. Zutr. 771, 772, ♀.

Pieris neombo, Bd. Sp. Gén. p. 539, ♀; Moore, Cat. Lep. E. I. C. pl. II. a, f. 3.

Pieris albina, Bd. Sp. Gén. p. 480, ♂.

Pieris galene, Feld. Voy. Novara, p. 165, ♂ var.

Pieris darada, Feld. *ib.* p. 166, ♂ var.

Hab.—(Males.) N. India, S. India, Penang, Java (Horsf., B. M.), Celebes, Bouru, Ceram, Gilolo, Batchian (Coll. Wall.), Obi?, Morty?, Philippines (Wall.).
 (Females, *white*.) N. India, Bengal, Ceylon, Philippines (W. W. Saund.), Bouru (Wall.), Obi, Morty (Voll.), Timor, Lombock, Amboina (Wall.).
 (Females, *yellow*.) Batchian, Aru Islands, Makian, (Wall.), Java (Horsf.).

The males vary from pure white with only a dusky costa, to such as have a dusky outer border extending up the nervures of the upper wings, and formed of small spots at the end of the nervures of the hind wings; and the females show every gradation from the delicately coloured form of the Moluccas (*neombo*, Bd.) to the darkest specimens of *paulina*, Cr. All the males, however, have the under surface of two tints—white and pale ochre, and the females all have a glossy tint of pearly white on the underside of the hind wings. The yellow form is described by Boisduval as a variety of *neombo*. The specimen from Gilolo, described by Vollenhoven (Mon. Pier. p. 36), seems intermediate, having the upper side yellow, while the under side is pearly white, the disc of the uppers only being yellow. I am informed by Mr. Semper that he possesses also from the Philippines specimens of these two forms with some which connect them.

18. *Tachyris Rouxii*, Boisduval.

Pieris Rouxii, Bd. Sp. Gén. p. 481, ♂.

Hab.—Punjaub, N. India (B. M., Coll. Hewitson, ♂).

This differs from *T. paulina*, ♂ (*albina*, Bd.), only in having the under surface uniform white.

19. *Tachyris psyche*, Felder.

Pieris psyche, Feld. Voy. Novara, p. 166.

Hab.—New Caledonia (Feld.), New Hebrides (Coll. W. W. Saunders).

This form differs from the rest by the lower wings and the apex of the uppers being “saffron yellow” beneath.

20. *Tachyris galathea*, Felder.

Pieris galathea, Feld. Verh. z.-b. Ges. Wien. 1862, p. 485 ;
Voy. Novara, p. 165.

Hab.—Nicobar Islands.

This appears hardly different from *T. paulina* (*T. albina* and *T. leis*).

21. *Tachyris ega*, Boisduval.

Pieris ega, Bd. Sp. Gén. p. 536, ♂ ; Guér. Voy. Favorite,
pl. ii. f. 2, ♂.

P. melania, Bd. Sp. Gén. p. 537 (*nec* Fab.), ♀.

Hab.—Australia (Coll. Wall., B. M.), New Caledonia (B. M.).

Specimens from Moreton Bay have the under side of the lower wings of the female richly bordered with orange both on the upper and anal margins. A female from New Caledonia in the British Museum is small, and on the under side has the uppers yellow at the base, and the disc of the lower wings uniform rich ochre-yellow. Two others from Australia have the disc of the lower wings beneath white, narrowly edged with orange. A small male from Lord Howe's Island, in the British Museum, has the wings more acute and only one spot on the uppers. This is decidedly not the *Papilio melania* of Fabricius, which has not yet been properly identified, and probably never will be.* It is therefore better to omit it altogether, since we most likely possess the same insect under some other name.

22. *Tachyris urania*, n. sp.

Male.—Above, white ; base of uppers and costa to the middle gray, thence with a black border to near the outer angle, broader at the apex and extending in points along the radial and median nervules ; an indistinct black line connects these points across the apex, and a sublunate spot between the second and third median nervules ; lower wings entirely white. Beneath : upper wings white, their apex and the lower wings pale lemon-yellow ; the costa, the extreme apex, and the transverse line faintly dusky ; the sublunate spot as above, but connected to a smaller indistinct spot at the extremity of the second median nervule ; lower wings

* Fabricius says, " alis posticis subtus obscure glaucis," and Godart, "le dessous des ailes inférieures est d'un vert-blanchâtre obscur." This is therefore evidently *not* the *P. melania* of Boisduval (the ♀ of his *P. ega*), which has the lower wings beneath pale yellow and rich orange.

with a group of dusky atoms just below the discoidal cell, and another barely visible near the outer angle.

Expanse of wings $2\frac{9}{10}$ in.

Hab.—Tondano, mountains of N. Celebes (Coll. Wall.).

This fine species has the hind wings broad and elongated almost as in *T. paulina*, but it is most nearly allied to *T. Jacquinotii*.

23. *Tachyris Jacquinotii*, Lucas.

Pieris Jacquinotii, Luc. Rev. et Mag. de Zool. 1852, p. 326, ♂ ;
Voll. Mon. Pier. p. 43.

P. zoe, Voll. Mon. Pier. p. 37, pl. 4, f. 5, ♂.

P. agave, Feld. Wien. Ent. Monats. vi. p. 286, ♂, ♀.

Female.—Above, very like *T. paulina*, but the base of the lower wings as well as the uppers is dusky, and the black border is broad at the outer angle, and diminishes to a point at the anal angle, being bounded above by a bluish shade in reversed proportions, which indents it between the nervures. Beneath, differs from *T. paulina* chiefly by the hind wings being pale ochre-yellow, with a posterior submarginal angulated band not reaching the anal angle, and the space beyond this is dusky-yellow.

Expanse of wings $2\frac{1}{4}$ — $2\frac{1}{2}$ inches.

Hab.—(Males.) Batchian, Bouru, Ceram, Philippines (Coll. Wall.); New Caledonia (Coll. W. W. Saunders).

(Females.) Batchian, Ceram (Wall.); Philippines (Feld.).

I have specimens connecting *T. Jacquinotii* and *T. zoe*, and the females from the two localities do not differ. The Philippine male is rather more yellow beneath, and the New Caledonian still deeper yellow, but even the Moluccan specimens differ considerably in tint.

24. *Tachyris alope*, Wallace.

Pieris amasene, Bd. Sp. Gén. p. 535, ♂ (*nec* Cr.).

Female.—Differs from that of *T. Jacquinotii* above only by having the costa more broadly black, and by the marginal band on the hind wings being broader and not bounded above by a bluish shade. Beneath differs only by the transverse apical band being broader.

Hab.—(Males.) Java, Sumatra, Borneo (Coll. Wall.); India.

(Females.) Java (Wall.); Sumatra and India (B. M.);

India (Moore), uniform yellow on lower wings beneath.

Vollenhoven (Mon. Pier. p. 35) describes as the female of this, that which I consider a variety of *paulina*, and which Boisduval described as *neombo*. It is true these resemble each other more than the pairs I have placed together, but that proves little. Horsfield paired them as I do, and the analogy of the sexes of *T. cga*, from Australia, is in its favour.

The Indian males and one from Sumatra (B. M.) are much deeper yellow beneath, but the markings agree exactly.

25. *Tachyris amarella*, n. sp. (Pl. IX. fig. 2, ♀.)

Female.—Wings rounded, outer margin of uppers concave. Above, sulphur-yellow; costa and base of uppers dusky, a broad black border occupying the outer half of both the wings, angulated on the inner margins; a row of five yellowish spots across the uppers, the second and third largest. Beneath: the dark band is violet-brown, paler near the margin, the spots violet-white, and there are two more indistinct spots near the outer angle; the base of the upper wings is orange, and the disc of the lower whitish, covered with light-brown scales.

Expanse of wings $2\frac{1}{10}$ inches.

Hab.—New Caledonia (one specimen, B. M.).

Probably near *T. alope*.

26. *Tachyris acrisa*, Boisduval.

Pieris acrisa, Bd. Bull. Soc. Ent. Fr. 1859, p. 156, ♂.

“Size and form of *P. amasene*, (Bd., *nec* Cramer), which it completely resembles above. Beneath, it is entirely different from all the species of this group; the whole underside of the hind wings and the tip of the fore wings are a clear yellow-ochre, with a row of submarginal black spots.” (Boisd.)

Hab.—Woodlark Island (East of N. Guinea).

Differs from *T. alope* as *T. psyche* does from *T. paulina*.

27. *Tachyris leptis*, Felder.

Pieris leptis, Feld. Voy. Novara, p. 163.

P. paulina, Bd. Sp. Gén. p. 538 (*nec* Cramer).

Hab.—Java, Borneo, N. India (♂, ♀, B. M., Coll. Wall.).

My specimen from Borneo is rather larger than the type from Java, and has a narrow black border only near the outer angle of the lower wings. Boisduval's description of both sexes is good, but

he omits to mention that the underside of the female is slightly dusky, caused by a few groups of ashy scales, and that the yellow margin is very indistinct. This is decidedly not the *paulina* of Cramer, whose figure represents a different insect, to which Boisduval's description of the female perhaps refers. I had named and described this species before receiving Dr. Felder's work.

b. *Liberia* group.

28. *Tachyris celestina*, Boisduval. (Pl. VIII. fig. 6, 6a, ♀.)

Pieris celestina, Bd. Sp. Gén. p. 484; Hew. Ex. Butt. vol. ii.

Pieris IV. f. 29, 30, ♂; Voll. Mon. Pier. p. 46.

Female.—Above, bluish-white or rich yellow; basal triangle dusky; broad border and apical triangle black, with four sub-apical spots of the colour of the disc. Beneath, the markings as above; in the white variety the disc pearly-white, the base of the uppers and the abdominal margin of the hind wings yellow, the costal margin of the hind wings chrome yellow, the apex of the upper and the outer margin of the hind wings purplish-ashy, the white spots diffused; in the yellow variety the border is deep and nearly uniform purplish-brown, the disc and spots of the uppers yellow as above, the disc of the hind wings pale ochre, with the costal and abdominal margins yellow. Head and thorax blackish, with dusky hairs. Antennæ dusky, obscurely ringed with white beneath.

Hab.—(Males.) New Guinea, Salwatty, Waigiou, Mysol, Aru Islands (Coll. Wall.).

(Females.) Aru Islands, Waigiou (Coll. Wall.).

The specimens described by Boisduval and Vollenhoven as females are males, as can be easily seen by examining the anal valves; specimens exactly similar are in my collection. From the close resemblance of the male to *T. Jacquinotii*, except in colour, I am strongly inclined to believe that the specimens above described are females of this species, a view which the localities above given renders probable. I obtained several of these females of both colours, varying somewhat in details, but evidently forming two distinct types of that sex, as occurs in *T. paulina*, and in both sexes in *T. cycinna*.

29. *Tachyris clementina*, Felder.

Pieris clementina, Feld. Sitz. Akad. Wiss. xl. p. 448, ♂; Voy. Novara, tab. xxv. f. 6.

Hab.—Amboina (Coll. Felder).

Female.—Above, exactly like *T. Jacquinotii*, ♀, but the black posterior border is not regularly scalloped between the nervures. Beneath, upper wings marked as in *T. celestina* ♀, but tinged with greenish-yellow, the tip deep ochre-yellow; lower wings ochre-yellow, the band and obscure submarginal spots (sometimes obsolete) as in *T. celestina* ♀.

Hab.—Ceram (Coll. Wall. and W. W. Saunders).

If I have rightly paired the sexes of *T. celestina*, then this is no doubt the female of *P. clementina*, Amboina and Ceram having in almost every case the same species of insects.

30. *Tachyris athama*, Lucas. (Pl. IX. fig. 1, ♀.)

Pieris athama, Luc. Rev. & Mag. de Zool. 1852, p. 336, ♀; Voy. au Pôl. Sud, Lep. pl. 1, f. 10, 11; Voll. Mon. Pier. p. 36.

Female.—Upper wings pointed, outer margin concave. Above, deep sulphur-yellow, sometimes orange-tinged; costal margin dusky, a broad jet-black marginal band forming a large triangle at the apex of the uppers, its inner border notched and enclosing three yellow spots, two close together near the apex, and one near the middle of the margin; band of the lower wings angulated within, leaving a narrow toothed yellow edging near the outer angle, and terminating at the anal angle. Beneath: disc of upper wings yellow, their base orange, their tip violet, with three whitish spots at the edge of the transverse notched black band; lower wings pearly-white, with a broad marginal band, violet without and nearly black within, a small spot on the outer and anal angles, and an edging along the inner margin rich chrome-yellow.

Expanse of wings $2\frac{1}{4}$ — $2\frac{3}{8}$ inches.

Hab.—New Caledonia (B. M., Coll. Hew.); “Balaou, N. Guinea” (Jacquinot).

A very beautiful insect, near the female of *T. celestina*. Lucas describes it as “blanc jaunâtre” above, and it is so represented in the “Voy. au Pôl. Sud,” which also gives the hind border too narrow, so that the insect is hardly recognizable.

31. *Tachyris cynisca*, n. sp.

Female.—Wings triangular, somewhat acute. Above, white, with a blackish border from the middle of the costa to the anal angle, of the same form on the uppers as in *T. Jacquinotii* ♀, base of uppers dusky-grey, deepening along the costa into the border, two very indistinct pale spots near the apex. Beneath: uppers

white, with the dark band browner, the apex ashy-violet, base of the wings yellow tinged; lower wings pearly-white, the border glossy purplish-ash, uniform; the inner margin with a fine yellow edging.

Expanse of wings $2\frac{1}{8}$ inches.

Hab.—Bouru (Coll. Wall.).

This is probably the female of a species allied to some of the preceding. It combines the characters of several of them.

32. *Tachyris cumelis*, Boisduval.

Pieris cumelis, Bd. Sp. Gén. p. 516.

Hab.—New Ireland (Voy. Coquille).

Appears to be near *T. cynisca*. I have not seen a specimen.

33. *Tachyris panthea*, n. sp.

Form and size of *T. nathalia* ♀.

Female.—Above, sulphur-yellow, the base broadly dusky-black, the costa and outer margin to the anal angle broadly black.

Beneath, like *T. nathalia* ♀, but the disk of the upper wings yellow, the apical band much wider; the hind wings with a broader pearly border, and a submarginal dusky sinuated band not reaching the outer or the anal angles.

Hab.—Philippine Islands (Coll. Hewitson and B. M.).

The yellow colour is very powdery and easily rubs off, so that worn specimens are white. The male will be like either *T. nathalia* or *T. zamboanga*.

34. *Tachyris cycinna*, Hewitson.

Pieris cycinna, Hew. Ex. Butt. vol. ii. *Pieris* IV. f. 23, 26, ♂.

P. ocina, Hew. l. c. f. 24, 25, ♀.

Hab.—Aru Islands (Coll. Wall.).

In my collection I have two males and two females, forming two pairs, which agree exactly, except that on the underside the lower wings and the base of the uppers are in one pair pure yellow, in the other bright orange. As they are all from the same locality it is probably one of those cases in which a decided variation occurs in the same brood, with no intermediate links.

35. *Tachyris corinna*, n. sp.

Male.—Above, exactly like *T. liberia*. Beneath, the upper wings have a black border along the outer margin, broadest at the apex and regularly narrowing to the outer angle; just within this at the apex is a spot yellower than the rest of the wing; the lower wings are uniform chrome-yellow, with a narrow black outer border, whereas there is a mere edging in *T. liberia*, which has a border of light yellow.

Expanse of wings $1\frac{3}{8}$ inch.

Female.—White, base of wings broadly dusky, shading into a broad black border, which is broadest at the apex and reaches the anal angle. Beneath: the border is of the same width and purplish, the disk of the uppers is greenish-white, with the base yellow, the lower wings are deep yellow.

Expanse of wings $1\frac{1}{8}$ inch.

Hab.—Waigiou (Coll. Wall.).

While the male so closely resembles *T. liberia* that it seems to have been considered the same species, the female differs altogether, being more like *T. cycinna* (*ocina*, Hew.).

36. *Tachyris liberia*, Cramer.

Papilio liberia, Cr. 210 G, H, ♂. *Pieris liberia*, Godt. Enc.

Méth. ix. p. 814; Bd. Sp. Gén. p. 484; (*nec* Voll.).

Female.—Above, bluish-ashy, the basal half and costa dusky; upper wings with a rather narrow black border, broadest at the apex and narrowing to the outer angle, its inner edge scalloped between the nervures; lower wings with a very narrow outer border, slightly produced along the nervures. Beneath, upper wings greenish, their tips and the whole surface of the lower wings chrome-yellow; two or three dusky spots near the outer angle at the margin; a very fine black edging round the wings. Hind margin straighter than in *P. eliada* ♀.

Expanse of wings $2\frac{1}{4}$ inches.

Hab.—Amboina (Coll. Wall.).

This species, well figured by Cramer, appears to be restricted to the small island of Amboina, since upon the adjacent island of Ceram another species is found which extends to Batchian, and which Vollenhoven supposed to be *T. liberia*, owing to his not having an Amboina specimen with which to compare it. The

rich chrome-yellow of the under surface in both sexes at once distinguishes Cramer's species.

37. *Tachyris eliada*, Hewitson.

Pieris eliada, Hew. Ex. Butt. vol. ii. *Pieris* IV. f. 27, 28, ♂.

P. liberia, Voll. Mon. Pier. p. 45, pl. 5, f. 4, ♀ (*nec* Cram.).

Hab.—Batchian, Ceram (Wall.), Obi (Voll.)

38. *Tachyris placidia*, Stoll.

Papilio placidia, Stoll, Suppl. Cr. pl. 28, f. 4, 4c, ♂. *Pieris placidia*, Bd. Sp. Gén. p. 483; Voll. Mon. Pier. p. 46, pl. 5, f. 5, ♀.

Hab.—Amboina, Batchian, Ceram, Morty, Waigiou (Wall.); Gilolo, Ternate (Voll.).

A curious species, with a peculiarity of colour hardly to be found elsewhere among *Lepidoptera*.

39. *Tachyris fatima*, Vollenhoven.

Pieris fatima, Voll. Tijds. v. Ent. 1866, p. 59, pl. 2, f. 1, 2, ♀.

Hab.—Celebes (Leyden Mus.).

This fine new species seems closely allied to the hitherto isolated *T. placidia*.

c. *Nero* group.

40. *Tachyris nero*, Fabricius.

Papilio nero, Fab. Ent. Syst. III. i. p. 153. *Pieris nero*, Bd. Sp. Gén. p. 485.

Pieris thyria, Horsf. Zool. Journ. iv. p. 69, t. 4, f. 2.

Hab.—N. India, Singapore, Sumatra, Java, Borneo (Coll. Wall.).

The specimens vary considerably in tint and in size, and slightly in form, but there are no well marked races in any of the above localities. The Borneo specimens seem to have rather acuter and more falcate wings.

41. *Tachyris galba*, n. sp.

Male.—Wings much more acute than *T. nero*, but less so than

T. zarinda; outer margin of fore wings concave to the apex; anal angle slightly produced. Above, colour the same as *T. nero*; upper wings with the base and costa dusky; a black border rather broad at the apex and vanishing at the outer angle, extending in points on the nervures, which are all black; a row of fine dusky sagittate spots on the nervures within the border, and a small angular spot at the upper corner of the discoidal cell. Lower wings with a narrow interrupted border, formed of spots across the ends of the nervures, from which a black line extends a short distance along each; base of the wings dusky. Beneath, hardly differs from *T. nero*, except that the submarginal spots on the upper wings are less defined and further from the margin.

Expanse of wings $3\frac{1}{4}$ inches.

Hab.—N. India (Coll. Moore).

This fine insect has a very distinct form from either of its allies, and probably inhabits some limited region of N. India.

42. *Tachyris domitia*, Felder.

Pieris domitia, Feld. Wien. Ent. Monats. vi. p. 285.

Hab.—Luzon, Philippine Islands (Coll. Wall.).

Hardly distinguishable from *T. nero*. Has rather broader fore wings, and generally a distinct dusky band across the hind wings beneath; the first and second median nervules of the upper wing are not black, as they seem always to be in *T. nero*.

43. *Tachyris zarinda*, Boisduval.

Pieris zarinda, Bd. Sp. Gén. p. 486, pl. 18, f. 4.

Hab.—Celebes, Sula Islands (Coll. Wall.).

This fine species varies much in colour, like *T. nero*.

44. *Tachyris bouruensis*, n. sp.

Female.—Above, red; base of all the wings dusky black, paler on the lower wings downwards to the anal angle, extending to the end of the cell in the uppers, where it sends off a prolongation at right angles to near the border, and then branches downwards in a waved submarginal line, distinct on the upper but almost obsolete on the lower wings; the costa narrowly black to the apex, which is black, whence a border of moderate width, and dentate on its inner edge, extends to the anal angle. Beneath: upper

wings light red, their apex and the lower wings pale reddish-ochre; a transverse irregular band beyond the end of the cell blackish, the outer border and a submarginal band on the lower wings dusky.

Wings rather elongated, their expanse $3\frac{1}{8}$ inches.

Hab.—Bouru (Coll. Wall.).

This insect may not improbably be the female of *T. zarinda*, some species of birds being common to Celebes and Bouru; but as it is quite as likely to be a distinct species I have thought it better to describe and name it. The specimen is unique in my collection.

45. *Tachyris zamboanga*, Felder.

Pieris zamboanga, Feld. Wien. Ent. Monats. vi. p. 285, (♂?);
Voy. Novara, tab. xxiv. f. 2, 3.

Hab.—Mindanao.

“Near *melania*, Fab.,” Feld. The figure in the Novara Voyage shows the female form of anal extremity, and it seems to me to be allied to *T. celestina* ♀. If, however, it be, as Dr. Felder says, a male, then I cannot help thinking that *T. asterope* is the female of it, and that it serves to connect the *celestina* group with *T. nephele*.

46. *Tachyris asterope*, Felder.

Pieris asterope, Feld. Wien. Ent. Monats. vi. p. 286, ♀.

Hab.—Luzon (Coll. Wall.).

“Near *T. zamboanga*; above, like *T. margarita*, Hübn.” (Feld.).
Very like *T. celestina* ♀, to which it may be allied.

47. *Tachyris ithome*, Felder.

Pieris ithome, Feld. Wien. Ent. Monats. iii. p. 4, tab. 3, f. 1, ♂;
Voll. Mon. Pier. p. 39, pl. 5, f. 1, ♀.

Hab.—Macassar, S. Celebes (Wall.); N. Celebes (Voll.).

This species and the next form a little group of very peculiarly marked *Pieridæ*.

48. *Tachyris nephele*, Hewitson.

Pieris nephele, Hew. Ex. Butt. vol. ii. Pieris V. f. 33, ♂;
Feld. Wien. Ent. Monats. v. p. 299, vi. p. 287, ♀.

Hab.—Luzon, Philippine Islands (Coll. Wall.).

Allied to *T. ithome*, which both sexes resemble.

d. *Pandione* group.49. *Tachyris pandione*, Hübner.

Hipposcritia pandione, Hübn. Zutr. 651, 652, ♂. *Pieris pandione*,
Bd. Sp. Gén. p. 537, ♀.

Pieris paulina, var., Voll. Mon. Pier. p. 33.

Hab.—Java (B. M., Coll. Wall.).

50. *Tachyris Lucasii*, Wallace.

Pieris pandione ♂, Bd. Sp. Gén. p. 537 (*nec* Hübner).

P. paulina, var., Voll. Mon. Pier. p. 33.

Male.—Above, almost exactly the same as *T. leptis*, Feld. (*paulina*, Bd.) and *T. indra*, Moore, ♂; the apex of the wings is, however, more produced, and the outer margin slightly concave, the hind margin and the ends of the nervures are finely dusky. Beneath, the black band across the uppers is shaped nearly as in *T. leptis*, but it has a sagittate white spot within it at the lower part; there is a faint dusky patch at the base of the cell, and the apex is amber-brown; the lower wings are closely speckled with dusky yellow-brown, across which are several darker waved or zigzag bands. The spot on the disco-cellular nervule is whitish and indistinct.

Expanse of wings $2\frac{6}{10}$ inches.

Hab.—Java (Coll. Wall.).

This species is very distinct from that with which it has been confounded. It is much nearer the male of *T. indra*, but that species differs slightly in form, and has a black disco-cellular spot on the underside of the lower wings.

51. *Tachyris indra*, Moore.

Pieris indra, Moore, Proc. Zool. Soc. 1857, p. 103, pl. 44,
f. 5, ♀.

Male.—Above very like *T. leptis*, but the band on the uppers is rather narrower and does not pass the first median nervule, the white spots vary from two to four; the hind wings have only a trace of black at the outer angle, and a minute black marginal dot, sometimes obsolete, between each pair of nervules. Beneath, the upper wings are white, greenish at the base, and pale ochre-brown at the apex, with the transverse black band much narrower than in *T. leptis*, the lower wings are pale ochre-yellow,

with groups of dusky atoms disposed in irregular macular bands, and a black disco-cellular spot.

Expanse of wings $1\frac{3}{8}$ inch.

Hab.—N. India (Coll. Wall., B. M.).

Pieris colimba, Bd., quoted by Moore, appears to be a MS. name, and should be altogether dropped.

52. *Tachyris phæbe*, Felder.

Pieris phæbe, Feld. Wien. Ent. Monats. v. p. 299; Voy. Novara, tab. xxv. f. 5, ♂.

Hab.—Luzon, Philippine Islands (B. M.).

This species comes nearest to *T. indra*.

53. *Tachyris zamora*, Felder.

Pieris zamora, Feld. Wien. Ent. Monats. vi. p. 286, ♂.

Hab.—Mindoro, Philippine Islands (Coll. Semper).

Dr. Felder considers this only a local modification of *T. phæbe*.

54. *Tachyris lalage*, Doubleday.

Pieris lalage, Doubl. Gen. of Diur. Lep. pl. 6, f. 3, ♀.

P. durvasa, Moore, Proc. Zool. Soc. 1857, p. 103, pl. 44, f. 6 (err. 4), ♂.

Hab.—N. India (Coll. Moore, B. M.).

The finest species of this group; common in collections from Darjeeling.

e. *Polisma* group.

55. *Tachyris polisma*, Hewitson.

Pieris polisma, Hew. Ex. Butt. vol. ii. *Pieris* VI. f. 38, ♂; vol. iii.

Pieris VIII. f. 55, ♀; Voll. Tijds. v. Ent. 1866, pl. 1, f. 3, 4, ♀.

Hab.—Macassar (Wall.); N. Celebes. (Voll.).

This curious little butterfly differs from every other species of *Pieridæ* in the shortness of its discoidal cells. It agrees, however, with *T. pandione* and allies, in having the tuft of bristles at the base of the anal valves of the male very well developed.

56. *Tachyris illana*, Felder.

Pieris illana, Feld. Wien. Ent. Monats. vi. p. 287, ♂.

P. ægis, Feld. *lib. cit.* v. p. 299; Voy. Novara, pl. xxiv. f. 1, ♀.

Hab.—Mindanao, Philippines (Coll. Wall.).

The occurrence of a species closely allied to *T. polisma* in Mindanao, is another example of the zoological connexion of this island and Celebes. *T. illana* marvellously resembles *Pieris cynis*, although it differs in important structural characters, such as the length of the discoidal cell, the structure of the anal valves, and the form of the club of the antennæ. I have little doubt but that *P. ægis* of Felder is the female of this species.

PRIONERIS, n. g.

Antennæ long, with a gradually thickened obconic club; head small, forehead very hairy, with the blunt terminal joint of the palpi not projecting much beyond it; body stout, anal valves of the male large, ovate, not tufted.

Upper wings triangular, the costa thickened and strongly toothed throughout its entire length; first and second subcostal nervules arising near together at some distance before the end of the cell, the second reaching the apex of the wing, the third of considerable length, and forming a wide angle with the nervure; the upper radial as a branch of the subcostal, the upper disco-cellular springing obliquely from the subcostal as if part of the second radial, and giving a peculiar arched form to the cell of the upper wings. Cell of the hind wings two-thirds the length of the wing.

This genus comprises a few large and fine Indian species, which seem to have no direct affinity with the rest of the old genus *Pieris*. They are well characterized by the extraordinary serrated costa, which in the larger species may be seen by the naked eye. The arrangement of the nervures of the upper wing is also very peculiar, and I am informed that Mr. Watson had already noticed the absence of the characteristic plumules from the wings of the males of this group, although they exist in all the other species of *Pieris*.

The species in several cases seem to mimic those of the genus *Thyca*. *P. thestylis* ♂, on the underside, most strikingly imitates *T. belladonna*, while the female resembles it on the upper side as well; *P. sita* is a perfect representation of *T. eucharis*; *P. cornelia* is equally like *T. singhapura*; and in all these cases the species of *Thyca* are very abundant, and are weak, slow-flying insects, while the mimicking species of *Prioneris* are rare, and in all cases the pairs which resemble each other inhabit the same district, and very often are known to come from the same locality.

1. *Prioneris thestylis*, Doubleday.*Pieris thestylis*, Doubl. Zool. Misc. p. 76.*Hab.*—North India, Darjeeling (Coll. Wall., B. M.).*Female.*—Almost exactly like *P. seta*, but rather larger, blacker, and the colour beneath a rather greenish gamboge-yellow, without any tint of orange as in that species (Coll. Moore).2. *Prioneris seta*, Moore.*Pieris seta*, Moore, Proc. Zool. Soc. 1857, p. 102, t. 44, f. 3, ♀.*Male.*—Above, white; upper wings with the costa, apex, and outer margin nearly to the outer angle, black, and all the veins beyond the cell black-margined; lower wings with a black fringe, and the orange markings of the under surface showing through. Beneath, the costal border is wider and with the apex is of a pale violet slate-colour, enclosing a white spot in the cell, and one or two others near the apex; the lower wings have patches of rich orange or chrome-yellow in the cell and between all the nervures, except two slaty patches, one below and the other above the base of the cell, the upper one enclosing a yellow spot.Expanse of wings $2\frac{1}{2}$ — $2\frac{3}{4}$ inches.This appears to be the most common form, but a series of variations occur by which it is brought nearer and nearer to *P. thestylis*.In the extreme form in this direction, the upper wings above are almost exactly as in *P. thestylis*; the lower wings differ in having only a very narrow dusky border, and in being of a different tint, owing to the orange colour of the under surface showing through. Beneath, the markings are almost identical in the two species, except that in *P. seta* the spots are all larger, especially the first from the abdominal margin, which extends down to and encloses the marginal spot, and in being all pale chrome or orange instead of pure gamboge-yellow, and the ground colour being of a purplish slate-colour, instead of nearly black.Expanse $3\frac{1}{4}$ inches. (*P. thestylis* $3\frac{5}{8}$ inches).*Female.*—The type is probably that represented by Mr. Moore. Mr. Watson, of Manchester, has, however, sent me for examination a curious specimen, which I believe to be a female approximating to the colouration of the male. Above, the upper wings differ from the male in having several dusky lines in the cell, leaving two or three distinct white spots near its upper border; the hind wings have a narrow black toothed border, and between the anal angle and the cell a large roundish ill-defined orange

patch. Beneath, the colouring is nearly as in the larger male specimens. The body is wanting, but the smooth costa shows it to be a female.

Expanse 3 inches.

Hab.—N. India, Darjeeling, Moulmein (Coll. Moore, Wall., B. M.).

A very puzzling species, but in most specimens quite distinct from *P. thestylis*, and always smaller and of a different colour. If the extreme form only remained (and it seems now most numerous) it would not be thought very closely allied to the species from which we can now hardly separate it.

3. *Prioneris sita*, Felder.

Pieris sita, Feld. Voy. Novara, p. 161, tab. xxv. f. 12.

Wings broad, the uppers triangular, with the outer margin straight.

Male.—Above, white; the upper wings with the veins black and gradually thickened towards the outer margin, where they spread and unite in a border; lower wings with the veins black and thickened near the outer and hind margin, only dilated at the ends and connected by a narrow black edge; there is a very faint dusky wavy line parallel to the outer margin on both wings. Beneath, as above, but the veins black and thickened on both wings, the apex of the uppers and the whole disc of the lower wings bright yellow, and round the hind margin of the latter a row of six light cinnabar-red spots, separated from the disc by a narrow black border, the spots narrowly bordered and notched with white.

Expanse of wings $3\frac{1}{4}$ inches.

Hab.—Ceylon (B. M., Coll. Wall. & Moore).

This remarkable species so closely resembles in marking and colour the common *Thyca eucharis* of India, more especially on the under surface, that it might easily be mistaken for it. I had described it as *P. eucharoides* before receiving Dr. Felder's work, and fear that Mr. Moore's name of *seta* for an allied species will create some confusion.

4. *Prioneris elemanthe*, Doubleday.

Pieris elemanthe, Doubl. Ann. Nat. Hist. xvii. p. 23.

P. Helferi, Feld. Voy. Novara, p. 161, tab. xxv. f. 10, 11.

Hab.—North India (Coll. Saunders and Wall.).

Dr. Felder's figure seems to represent only a slight modification of the ordinary form of this species.

Female.—Above: upper wings dusky, with whitish bands in the cell and parallel to the inner margin, and two curved rows of linear whitish spots beyond, the inner ones larger, more ovate, and better marked; lower wings creamy-white, with a broad dusky outer border, which is prolonged along the nervures to the cell, and encloses a row of faint whitish rounded spots. Beneath, upper wings as above; lower wings as in the male, but the yellow tint paler and extending over the spots at the outer angle. (B. M.)

5. *Prioneris berenice*, Lucas.

Pieris berenice, Luc. Rev. & Mag. de Zool. 1852, p. 324.

Hab.—Silhet.

This seems very near *P. clemathe*; I give the author's description:

"Near *autothisbe*. Wings white, the uppers with a black border formed of united spots; hind wings slightly yellow-tinged towards the base and abdominal margin, with a narrow black border extending on the nervures towards the outer angle in triangular patches. Beneath, the uppers as above, the nervures black-bordered, the hind wings *bright orange-brown*, with the *veins and border deep black, and a marginal row of white spots*; the base marked with a red spot."

The passages italicised show marked differences from *P. clemathe*. I have not seen a specimen.

6. *Prioneris Vollenhovi*, n. sp. (Pl. IX. fig. 3, ♂.)

Form of wings as in *P. thestylis*.

Male.—Above, as in *P. clemathe*, but the apex rather more dusky, and the posterior border wider, with the terminations of the veins more deeply bordered. Beneath, upper wings as above; lower wings with the nervures all black and thickened, the basal two-thirds and four spots at the outer angle rich yellow, the anal angle black, extending in a dusky border to the middle of the hind margin, at the base of the wing a hairy red patch as in *P. clemathe*.

Expanse of wings $3\frac{3}{8}$ inches.

Hab.—Borneo, Sarawak (Coll. Wall. and W. W. Saunders).

7. *Prioneris cornelia*, Vollenhoven.

Pieris cornelia, Voll. Mon. Pier. p. 5, pl. 2, f. 2.

Hab.—Borneo (Leyden Museum).

This species in form and colouring resembles *Thyca singapura*,

although it differs so remarkably in structure. I have not seen a specimen.

8. *Prioneris philonome*, Boisduval.

Pieris philonome, Bd. Sp. Gén. p. 453, ♂.

Hab.—Java (Coll. Payen).

A rare species, allied to *P. clemathe* and *P. Vollenhovii* by the curious hairy red patch at the base of the lower wings beneath. I have not seen a specimen.

9. *Prioneris autothisbe*, Hübner.

Pieris autothisbe, Hübn. Samml. Ex. Schmett. ii. tab. cxxiii.; Bd.

Sp. Gén. p. 452; Voll. Mon. Pier. p. 20, pl. 3, f. 5, ♀.

Hab.—Java (Wall.). (B. M. ♀.)

I took this species at 4,000 feet elevation on the mountains of West Java. Vollenhoven has made known the female, which by its black upper wings shows its affinity with *P. thestylis*.

ERONIA, Hübner.

The Eastern species of *Eronia* form a compact and homogeneous group of very closely allied forms, several of which are hardly more than slight geographical modifications. These insects frequent most generally the dry and open forests and plantations. They fly tolerably quickly, with an undulating movement, and often settle upon flowers. The clear blue tints with which the males are adorned render them striking objects in the forests of the Malay Islands.

1. *Eronia avatar*, Moore.

Eronia avatar, Moore, Cat. Lep. E. I. C. p. 61, pl. ii. a, f. 1, ♂.

Hab.—N. India, Darjeeling (Coll. Wall.).

Female.—Apex rather more rounded than in the male; dusky, with the spaces between the nervures whitish, as in *E. valeria* and *iobæa*, but leaving only the nervures and outer margin (enclosing the submarginal row of spots) dusky. Beneath, silvery, with the nervures obscurely dusky, the median nervure and its branches on the upper wing broadly blackish (Coll. Moore).

This fine species seems to be an extreme development of the *valeria* type.

2. *Eronia valeria*, Cramer.

Papilio valeria, Cr. 85 A. *Pieris valeria*, Bd. Sp. Gén. p. 444.

Eronia valeria, Voll. Mon. Pier. p. 56.

Hab.—Malacca, Sumatra, Java, Borneo, Lombock, Flores (Coll. Wall.).

In this species the male is nearly constant, while the female, as in the whole genus, varies exceedingly, often more or less closely imitating species of *Danaïs*. The Bornean males have rather more elongate fore wings, with a slightly concave outer margin.

3. *Eronia hippia*, Fabricius.

Papilio hippia, Fab. Ent. Syst. III. i. p. 59; Don. Ins. India, pl. 25, f. 1. *Danaïs hippia*, Godt. Enc. Méth. ix. p. 193.

Pieris valeria, var. A, Bd. Sp. Gén. p. 445.

Eronia gæa, Feld. Voy. Novara, p. 190.

Hab.—India (Coll. Wall., B. M.)

This species has been generally confounded with *E. valeria*, but it is quite as distinct as most of the other species of the genus. It is undoubtedly the *hippia* of Fabricius and Godart. The female differs less from the male than in any other species of the genus.

4. *Eronia bæbera*, Eschscholtz.

Paphia bæbera, Esch. Voy. Kotzebue, vol. iii. (♀ fig.). *Eronia bæbera*, Feld. Wien. Ent. Monats. vi. p. 288, ♂.

Hab.—Philippine Is. (Luzon and Mindoro). (Coll. Wall., B. M.)

Closely allied to *E. hippia*.

5. *Eronia ceylanica*, Felder.

Eronia ceylanica, Feld. Voy. Novara, p. 191.

Hab.—Ceylon (Coll. Wall.).

Barely distinct from *E. hippia*.

6. *Eronia argolis*, Felder.

Eronia argolis, Feld. Wien. Ent. Monats. 1860, p. 52; Voll. Mon. Pier. p. 58, pl. 7, f. 2, ♀.

Hab.—Batchian, Gilolo (Coll. Wall.).

A richly-marked species. The female, as in several others of the genus, is often more or less tinged with yellow.

7. *Eronia tritæa*, Felder.

Eronia tritæa, Feld. Wien. Ent. Monats. vi. p. 288, t. 3, f. 2, ♂;
Voll. Mon. Pier. p. 58, pl. 7, f. 3, ♀.

Hab.—Celebes (Macassar and Menado). (Coll. Wall.)

8. *Eronia phocæa*, Felder.

Eronia phocæa, Feld. Wien. Ent. Monats. v. p. 299, ♂; vi. p.
288, ♀.

Hab.—Mindanao (Coll. Wall.).

Near *E. tritæa* and *E. argolis*.

9. *Eronia iobæa*, Boisduval.

Picris iobæa, Bd. Voy. Astrol. p. 57, pl. 2, f. 5, 6, ♂ (err. ♀);
Sp. Gén. p. 445. *Eronia iobæa*, Voll. Mon. Pier. p. 57, pl. 7,
f. 1, ♀.

Hab.—Ceram, Waigiou, New Guinea (Coll. Wall.).

The males do not vary perceptibly; the females vary in colour from bluish-white to pale yellow or ochre-yellow, and the markings from being as prominent as in the specimen figured by Vollenhoven to others in which the whole surface is brown-black, with a submarginal row of spots, and faint traces of the usual markings.

CALLOSUNE, Doubleday.

This African genus is restricted in the East to Southern Central and North Western India, and Ceylon. It is the tropical form of our northern *Anthocharis*.

1. *Callosune eucharis*, Fabricius.

Papilio eucharis, Fab. Syst. Ent. p. 472 (nec Drury). *Anthocharis eucharis*, Bd. Sp. Gén. p. 568.

Hab.—India, Ceylon (B. M.); Deccan (Coll. Moore).

2. *Callosune danae*, Fabricius.

Papilio danae, Fab. Syst. Ent. p. 476. *Anthocharis danae*, Bd.
Sp. Gén. p. 570.

Hab.—Central India, Ceylon (B. M.).

3. *Callosune etrida*, Boisduval.*Anthocharis etrida*, Bd. Sp. Gén. p. 576.*Hab.*—Punjaub, N. India, Ceylon (B. M.).

In the Ceylon specimen the border of the hind wings is continuous, otherwise it agrees with the Indian form.

(*Anthocharis daphalis*, Moore, Proc. Zool. Soc. 1865, p. 491, pl. 31, f. 14, from Kunawur, N. W. India (10,000 feet alt.), belongs to the Palæarctic fauna.)

COLIAS, Boisduval.

This northern genus ranges over the higher parts of the Himalayan range as far as Assam, and one species has been recently described from the Nilgherries. Of the nine species here introduced not more than three or four can be properly said to belong to the Indian region. One is described from the Sandwich Islands.

1. *Colias Fieldii*, Ménétries.*Colias Fieldii*, Ménétries, Cat. Imp. Acad. p. 79, t. 1, f. 5.*Hab.*—N. W. Himalayas (Coll. Moore, B. M.).A geographical form of *C. myrmidone*.2. *Colias xenodice*, Felder.*Colias xenodice*, Feld. Wien. Ent. Monats. iii. p. 394.*Hab.*—Assam (Feld.) ; Nepal (Wall. ex Coll. Hardwicke).Barely distinct from *C. edusa* or *C. myrmidone*.3. *Colias eogene*, Felder.*Colias eogene*, Feld. Voy. Novara, p. 196, pl. xxviii. f. 7.*Hab.*—Himalaya (Coll. Felder).Near *C. Boothii*, Curtis.4. *Colias Ponteni*, Wallengren.*Colias Ponteni*, Wallengren, Wien. Ent. Monats. iv. p. 33.

“ Alis supra fulvido-flavis, maris iridatis, macula discoidali anticarum, limbo latissimo omnium, costisque extra cellulam, nigris ; apice anticarum flavo-maculato, omnibus maris infra fulvido-flavis, posticis apiceque anticarum fœminæ grisescente

flavis; anticis circulo discoidali ferrugineo, posticis macula ferruginea discoidali, costa flava intersecta margineque interiore late nigro-pustulato." (Wallengren.)

Hab.—Honolulu, Sandwich Islands.

5. *Colias hyale*, Linnæus.

Papilio hyale, Lin. S. N. i. p. 469. *Colias hyale*, Bd. Sp. Gén. p. 650.

Hab.—N. India, Nepal (Coll. Moore, B. M.).

6. *Colias neriene*, Fischer.

Colias neriene, Fischer, Ent. Russ. Lep. t. 11, f. 3, 4; Bd. Sp. Gén. p. 646.

Hab.—N. W. Himalayas (6,000—10,000 feet elevation, Capt. Lang).

7. *Colias nilagiriensis*, Felder.

Colias nilagiriensis, Feld. Wien. Ent. Monats. iii. p. 395.

Hab.—Malabar (Nilgherries). (Coll. Felder.)

A geographical modification of *C. neriene*.

8. *Colias shipkee*, Moore.

Colias shipkee, Moore, Proc. Zool. Soc. 1865, p. 492, pl. xxxi. f. 13.

Hab.—N. W. India (13,000 to 15,000 feet alt., Capt. Lang).

9. *Colias ladakensis*, Felder.

Colias ladakensis, Feld. Voy. Novara, p. 197, pl. xxvii. f. 8, 9, ♂.

Hab.—Himalaya, Ladak, Spiti (Dr. Stolickza). (Coll. Felder.)

IDMAIS, Boisduval.

This African and desert genus is represented only by five species in North Western, Western and Southern India.

1. *Idmais calais*, Cramer.

Papilio calais, Cr. 53 C, D, 351 A, D. *Idmais calais*, Bd. Sp. Gén. p. 587.

Pieris amata, Godt. Ent. Méth. ix. p. 131.

Hab.—Madras, S. India (B. M.).

2. *Idmais phisadia*, Godart.

Pieris phisadia, Godt. Enc. Méth. ix. p. 132. *Idmais phisadia*, Bd. Sp. Gén. p. 587.

Hab.—N. W. India (B. M.).

3. *Idmais dynamene*, Klug.

Pontia dynamene, Klug, Symb. Phys. Ins. t. 7, f. 5, 6. *Idmais dynamene*, Bd. Sp. Gén. p. 588.

Hab.—Punjaub (B. M.).

4. *Idmais fausta*, Olivier.

Papilio fausta, Oliv. Voy. en Syrie, t. 33, f. 4. *Idmais fausta*, Bd. Sp. Gén. p. 586.

Hab.—N. W. India (B. M.).

5. *Idmais fulvia*, n. sp. (Pl. IX. fig. 5, ♂, ♀.)

Near *I. fausta*.

Male.—Upper wings with the outer margin more convex, the apex blacker, leaving a row of small spots, the discoidal spot very large and nearly round; thorax and abdomen blackish. Beneath, paler in colour, the markings more distinct, and the discoidal spot much larger than in *I. fausta*.

Female.—Resembles the male, but the brick-red colour is replaced by white.

Expanse of wings, 2 inches.

Hab.—S. India (Moore); Scinde (B. M.).

THESTIAS, Boisduval.

This is an especially Indian genus. In the Archipelago one species is found in Sumatra, two in Java, and one in each of the small islands as far as Timor. It is not known from Borneo or from any other parts of the Archipelago. It seems to inhabit only mountainous and rather dry districts, and this has probably determined its peculiar distribution. Many of the species are very variable, especially in the female sex, and I have had much difficulty in grouping them satisfactorily.

1. *Thestias venilia*, Godart.

Pieris venilia, Godt. Enc. Méth. ix. p. 121. *Thestias venilia*, Bd. Sp. Gén. p. 594; Voll. Mon. Pier. p. 51.

Papilio ænippe, Cr. 157 C, D, ♀ ?.

Hab.—Java (Horsf.); Timor ? (Voll.).

This distinct species is probably confined to Java, where it is very scarce.

2. *Thestias Reinwardtii*, Vollenhoven.

Thestias Reinwardtii, Voll. Tijd. v. Ent. iii. p. 126; Mon. Pier. p. 50, pl. vi. f. 1, ♂.

Female.—Above, upper wings black, the internal border broadly white, the base dusky, a white oblique spot across the origin of the subcostal nervules, a smaller one below it, and three ovate spots near the outer margin; lower wings white, the base dusky, and a broad black outer border. In one specimen the markings of the upper wings are more developed, and of a yellow colour. Beneath, upper wings pale yellow, more or less irrorated with dusky, a large brown discoidal spot, beyond which is an irregular brown band, merging in a large patch at the outer angle; lower wings ochre-yellow, sparsely irrorated on the disc, and densely on the outer margin, a small discoidal spot, and between it and the border a row of six or seven rufous-brown spots, dusky-margined, the third and fourth largest, and the whole nearly confluent.

Hab.—Baly, Lombock, Flores (Coll. Wall.).

A well-marked species, variable in the female, and restricted to the islands between Java and Timor.

3. *Thestias balice*, Boisduval.

Thestias balice, Bd. Sp. Gén. p. 593, ♂.

Hab.—Java (B. M.), ♂.

4. *Thestias Vollenhovii*, Wallace.

Thestias balice, Voll. Mon. Pier. p. 50, ♂, ♀ (*nec* Boisd.).

Hab.—Timor (Coll. Wall.), ♂, ♀.

Vollenhoven's description is correct. Boisduval's refers to the Java form, which is sufficiently distinct.

5. *Thestias venatrix*, n. sp.

Male.—Above, yellow; the hind wings with a very narrow dark edge, extending slightly on the nervures at the outer angle; fore wings with a large triangular orange-red patch in the middle, surrounded by a black border, narrow within and on the costa, wider at the apex and outer margin, the nervures and a discoidal spot black; the base of the wing bluish, and of the costa brown. Beneath: upper wings yellow, their margins and the whole of the lower wings pale yellow, thickly irrorated with reddish-ochre, discoidal spot on the lower wings of the same colour and small, on the upper wings larger and black.

Smaller than *T. balice*, to which it is allied.

Hab.—Moulmein (B. M.).

6. *Thestias marianne*, Cramer.

Papilio marianne, Cr. 217 C, D, E. *Thestias marianne*, Bd. Sp. Gén. p. 592, ♂, ♀.

Hab.—India (Coll. Wall., B. M.).

In a female from Madras, the transverse black band does not pass below the end of the cell, and some of this form in the British Museum are small, and have a narrow border; in another, from Bengal, the whole upper surface is tinged with ochre-yellow. One from the Punjaub is very large and finely coloured.

7. *Thestias pyrene*, Linnæus.

Papilio pyrene, Linn. Syst. Nat. ii. p. 762. *P. pyrene*, Cr. 125 A, B, C, ♂. *Thestias pyrene*, Bd. Sp. Gén. p. 593, ♂.

Papilio ænippe, Drury, Exot. Ent. pl. 5, f. 2, ♂ (good). *P. ænippe*, Cr. 229 B, C.

Papilio sesia, Don. Ins. China, pl. 31, f. 2 (bad).

Male.—Drury's figure is the best, and serves well to identify the species. It differs from Cramer's *pyrene* above, by the wings being more acute, the orange patch less regular, and the black border to the hind wings generally wider. Beneath, it varies from clear yellow—with a small black discoidal spot on each wing, a blackish spot at the outer angle of the uppers, and two or three indistinct orange spots between the discoidal spot and the margin of the lower wings—to ochreish-yellow, thickly speckled with black on the costal region of the uppers and the whole surface of the lower wings, and the two or three orange submarginal spots more diffused. It differs strikingly from Cramer's *pyrene* in the entire absence of the row of brown spots with white ocelli.

Female.—Something like Cramer's *ænippe* (229 B, C), and perhaps the same (not 105 C, D). It varies greatly in size and colouring, as pointed out by Mr. Moore, from Capt. Lang's notes. It is always white and black, or nearly so, and offers the greatest difference of the sexes in this genus.

Expanse of wings (male) $2\frac{1}{4}$ — $2\frac{3}{4}$ inches; (female) $2\frac{1}{4}$ — $2\frac{7}{8}$ inches.

Hab.—N. India, Bengal, China (B. M., Coll. Wall.).

The largest specimens of both sexes are from Darjeeling. Those from the N. W. Himalayas are of moderate size, while those from the plains of Punjaub and Oude are smaller and less richly coloured. These last are hardly distinguishable from some specimens of *T. pircnassa*. The two in fact may well be con-

sidered as one abundant and variable species, which has become segregated into several forms, which may be divided into two pretty well-marked groups.

There has been great confusion about this species. Drury's is the best and most recognizable figure I have seen. The Linnæan description is so imperfect that the name ought perhaps not to be retained, but it has been so generally applied to some of the forms of this species that I think it better to keep to it.

8. *Thestias pirenassa*, n. sp. (Pl. IX. fig. 4, ♂.)

Thestias ænippe, Bd. Sp. Gén. p. 591, ♀ (as ♂) ?, (nec Cr., Dru.).

Male.—Costa much curved, hind wings subtriangular.

Above, like *T. pyrene*, but the transverse black band always touches the discoidal spot of the uppers. Beneath, yellow, faintly speckled with black; on the hind wings a row of six or seven spots, of which one on the inner margin, as well as the third and fourth, are larger and have pearly or violet-white ocelli.

Female.—Very like the male, differing only in the orange patch being smaller and less regular, and having two black spots on its lower part. Beneath, as in the male, but the spots are more distinct, and almost all have white ocelli.

Expanse of wings (♂ and ♀), 2 inches.

Hab.—Bombay, Madras (Coll. Wall., Moore).

Variety A.—Is rather clearer in colour, has the upper wings rather more acute, and a trace only of border on the hind wings in both sexes. Beneath, of a richer chrome-yellow tint. The female generally as in the type, but sometimes almost white as in the extreme form of *T. pyrene* ♀.

Expanse of wings, ♂ 2 inches; ♀ $1\frac{3}{4}$ —2 inches.

Hab.—Sylhet, Darjeeling (Coll. Wall., Moore).

Variety B. Male.—Hind wings rather less triangular, transverse band completely enclosing the discoidal spot, under surface clear yellow, with minute discoidal spots, as in the extreme form of *T. pyrene* ♂. *Female*.—Pale yellow, with a broader dusky border, the spot on the upper wings smaller and more divided by the nervures, either the same yellow as the disc or more or less tinged with orange; beneath, ochreish or chrome-yellow, marked as in the female of *T. pyrene*.

Expanse of wings, ♂ 2 inches; ♀ 2— $2\frac{1}{4}$ inches.

Hab.—Bengal, N. India (Coll. Moore).

9. *Thestias Ludekingii*, Vollenhoven.

Thestias Ludekingii, Voll. Tijd. v. Ent. iii. p. 125; Mon. Pier.
p. 49, pl. 5, f. 6, ♀.

Hab.—Sumatra (Leyden Museum).

A distinct species, allied to *T. pirenassa*.

IPHIAS, Boisduval.

This genus consists of the largest and most gaudily-coloured *Pieridæ*, and is especially characteristic of the Malayan Islands. For more than eighty years it had consisted of two species only, when I had the good fortune to discover two more in the Moluccas, and the group now comprises six sufficiently distinct species, all of which are found in the Malay Archipelago, one of them only ranging out of it over all tropical Asia. The Moluccas and Timor are the eastern limits of the group, no specimen having yet been found in New Guinea.

1. *Iphias glaucippe*, Linnæus.

Papilio glaucippe, Lin. S. N. ii. p. 762; Cr. 164 A, B, C. *Iphias glaucippe*, Bd. Sp. Gén. p. 596.

Hab.—(Type).—India, Sumatra, Celebes (Coll. Wall., B. M.).
(Var.).—Java, Flores, Timor, Philippine Is. (Coll. Wall., B. M.).

This species has a wide range and varies slightly in each locality in form, size, and colouration. These variations may be best grouped under two forms,—the type, which has the orange patch bordered with black on the inner side,—the variety which has little or no black separating the orange from the white of the wings. The Celebes specimens are very large and have very acutely-pointed wings. The Celebes form has most black, the Timor form least; and if the species became extinct over the remainder of its range, these two would undoubtedly be considered distinct, since they differ constantly both in form and markings.

2. *Iphias borneensis*, n. sp.

Iphias glaucippe, var., Wall. Journ. Ent. vol. 2, p. 3.

Male.—Like *I. glaucippe*, but the orange apical patch much reduced, leaving a wide border all round it, which at the apex encroaches on the black spots; lower wings sometimes with a submarginal row of small spots.

Female.—Like *I. glaucippe*, but the apical patch small and

white, the disc of the hind wings only tinged with sulphur-yellow, and the margin more broadly black.

Hab.—Borneo (Coll. Wall.), (♀ B. M.).

This interesting species bears the same relation to *glaucippe* that *leucogynia* does to *leucippe*; the female being coloured white and black only.

3. *Iphias Vossii*, Maitland.

Iphias Vossii, Mait. Tijd. voor Ent. ii. p. 25; Voll. Mon. Pier.
p. 55, pl. vi. f. 4.

Hab.—Island of Nias, near Sumatra (Leyden Mus.).

4. *Iphias sulphurca*, Wallace.

Iphias sulphurea, Wall. Journ. of Ent. vol. 2, p. 5.

I. Felderi, Voll. Mon. Pier. p. 53, pl. 6, f. 2, 3, ♂, ♀.

Hab.—Batchian, Gilolo, Morty Island (Coll. Wall.).

5. *Iphias leucogynia*, Wallace.

Iphias leucogynia, Wall. Journ. of Ent. vol. 2, p. 4, pl. 1, f.
1 ♂, f. 2 ♀.

Hab.—Bouru (Coll. Wall.).

6. *Iphias leucippe*, Cramer.

Papilio leucippe, Cr. 36 A, B, C. *Iphias leucippe*, B.l. Sp.
Gén. p. 596.

Hab.—Amboina, Ceram (Coll. Wall.).

This magnificent insect is not uncommon in Amboina as well as in Ceram, although the Leyden Museum possesses no specimens from the former locality.

DERCAS, Boisduval.

A small group of insects separated from *Gonepteryx* by Dr. Boisduval, and now generally adopted. Their wings are larger in proportion to their bodies, their antennæ more slender, the wing cells much shorter, and the radial of the lower wing is very differently situated. *Dercas goblrias* flies slowly in forest clearings near the ground, often settling in damp places. The genus seems confined to India, Borneo, and Sumatra.

1. *Dercas gobrias*, Hewitson.

Gonepteryx gobrias, Hew. Trans. Ent. Soc. 3rd ser. vol. ii. p. 246, pl. xvi. f. 1, ♂; Butler, Proc. Zool. Soc. 1865, p. 432, pl. xxv. fig. 4, ♂, ♀.

Female.—Larger than the male, pale yellow, the discoidal spot and transverse streak almost obsolete.

Hab.—Sumatra, Borneo (Coll. Wall., B. M.).

2. *Dercas Verhuellii*, Van der Hoeven.

Colias Verhuellii, Van d. Hoeven, Tijds. Nat. Gesch. 1838, t. 8, f. 3, 4, ♂.

Rhodocera lycorias, Doubl. Zool. Misc. 1842, p. 77 (wood cut) ♀.

Hab.—N. India, Silhet (Coll. Wall., B. M.).

The female has the apex of the wings more falcate and acute than the male, and the markings and outline of the wings vary considerably.

In the "Genera of Diurnal Lepidoptera," Mr. Doubleday puts his *R. lycorias* ♀ as a synonym of *D. Verhuellii*, but retains *lycorias* ♂ as a distinct species from Silhet. As no specimen answering to his description exists in the British Museum, or in any private collection with which I am acquainted, I am inclined to think that the specimen was probably compounded of the fore wings and body of *D. Verhuellii*, with the hind wings of a *Callidryas*.

3. *Dercas Wallichii*, Doubleday.

Gonepteryx Wallichii, Doubl. Proc. Ent. Soc. 1848, p. xlvii.

G. urania, Butler, Proc. Zool. Soc. 1865, p. 458, pl. xxvi. f. 5.

Hab.—N. India (B. M.).

This species agrees better with *Dercas* than with *Gonepteryx*, by the short discoidal cells, though it is somewhat intermediate between the two genera.

GONEPTERYX, Leach.

Of this genus two species of the European type enter the Indian region on its north-western boundary, and these are probably confined to the higher ranges of the Himalayas. A third species has been described by Dr. Felder, from Northern China,

1. *Gonepteryx nipalensis*, Doubleday.

Gonepteryx nipalensis, Doubl. Gen. Diurn. Lep. p. 71.

G. rhamni, G. R. Gray, Lep. Ins. Nepaul. t. 5, f. 1 (*nec* Linn.).

Hab.—N. India, Darjeeling (B. M.).

2. *Gonepteryx zanea*, Moore.

Gonepteryx zanea, Moore, Proc. Zool. Soc. 1865, p. 493, pl. xxxi. f. 18.

Hab.—N. W. Himalayas (B. M.).

"In thick forests about Narkunda, 50 miles from Simla." (Capt. Lang).

3. *Gonepteryx acuminata*, Felder.

Gonepteryx acuminata, Feld. Wien. Ent. Monats. vi. p. 23.

Hab.—Ning-po, China (Coll. Felder).

A variety of *G. aspasia*, Men., from the Amur.

CALLIDRYAS, Boisduval.

This wide-spread tropical genus is fairly represented in the Malay Islands. Most of the species are very abundant in individuals, frequenting the open country, gardens and river banks, and in the dry season settling by hundreds together on wet and muddy places, or on the extreme edge of the sinking waters of the streams. Some of the named species are distinguished by such slight characters that it is possible they may in some cases be different forms (perhaps different broods) of the same species.

1. *Callidryas thisorella*, Boisduval.

Callidryas thisorella, Bd. Sp. Gén. p. 609.

Hab.—India, Australia (Queensland). (Coll. Wall., B. M.)

A female from Australia only differs from the male above in the larger discoidal spot. Beneath, it is of a pinkish pearly tint, with the irrorations obsolete, a large dusky discoidal spot and another small one on each wing, and a faint submarginal line formed of dusky patches on both wings.

2. *Callidryas philippina*, Cramer.

Papilio philippina, Cr. 361 C, D. *Callidryas philippina*, Bd. Sp. Gén. p. 619.

Hab.—Bengal, Central India. (Coll. Wall., B. M.)

3. *Callidryas pyranthe*, Linnæus.

Papilio pyranthe, Lin. S. N. ii. p. 763. *Callidryas pyranthe*,
Bd. Sp. Gén. p. 611.

Papilio alcyone, Cr. 58 A, B, C.

Hab.—N. India, Malacca, Sumatra, Java, Flores, China, Formosa, Philippine Islands (Coll. Wall.).

The specimens from Formosa are very large, but agree in colour and marking with those from other localities; another specimen from the same place is as remarkably small.

4. *Callidryas minna*, Boisdual.

Callidryas minna, Bd. Sp. Gén. p. 612.

Hab.—India, Flores (Wall.); Australia (Voy. Novara).

I took a specimen of what seems to be this species in Flores. It has a less acute apex and a more rounded outer margin of the fore wings than in *C. pyranthe*, and the border is more regularly curved within, and extends farther along the costa.

5. *Callidryas alcmeone*, Cramer.

Papilio alcmeone, Cr. 141 E. *Callidryas alcmeone*, Bd. Sp. Gén. p. 627.

? *Papilio catilla*, Cr. 229 D, E.

Hab.—India, Malacca, Sumatra, Java, Borneo, Philippine Islands, Celebes, Moluccas, Timor (Coll. Wall.).

6. *Callidryas hiliaria*, Cramer.

Papilio hiliaria, Cr. 339 A, B. *Callidryas hiliaria*, Bd. Sp. Gén. p. 626.

Papilio jugurtha, Cr. 187 E, F.

Hab.—India, Malacca, Borneo, Java, Lombock, Timor, Batchian, Australia (Coll. Wall.).

7. *Callidryas crocale*, Cramer.

Papilio crocale, Cr. 55 C, D, ♀. *Callidryas crocale*, Bd. Sp. Gén. p. 625.

Callidryas endeer, Bd. Voy. Astrol. p. 63, pl. 2, f. 3, 4, ♀.

Male.—Above, sulphur-yellow, the outer margins paler, and the base of a different texture as in *C. alcmeone* and *C. hiliaria*, but with no marked difference of colour. Beneath, exactly like *C. alcmeone*, but differs in tint as above.

Female.—Varies much, from a yellow form very like *C. hiliaria* ♀,

to the dark insect figured by Boisduval. Beneath, the colour is in some specimens nearly uniform yellow or buff, in others there is a distinct submarginal zigzag dusky band.

Hab.—Celebes, Philippine Islands, Batchian, Ceram, Timor, Australia, Queensland (Coll. Wall.).

This has been confounded by Vollenhoven with *C. alcmeone*, from which, however, it is quite distinct. The Timor specimens are very small in both sexes.

8. *Callidryas phlegæus*, n. sp.

Male.—Above, exactly like *C. crocale* ♂. Beneath, like *C. hilaria* ♂. Thus differing from *C. crocale* just as *C. hilaria* differs from *C. alcmeone*.

Hab.—Timor (Coll. Wall.).

If *C. hilaria* and *C. alcmeone* are maintained as distinct species, we cannot refuse the same rank to this form.

9. *Callidryas gorgophone*, Boisduval.

Callidryas gorgophone, Bd. Sp. Gén. p. 632.

Hab.—Australia, Queensland (Coll. Wall.).

10. *Callidryas scylla*, Linnæus.

Papilio scylla, Lin. S. N. ii. p. 763; Cr. 12 C, D. *Callidryas scylla*, Bd. Sp. Gén. p. 631.

Hab.—Java, Sumatra, Lombock, Timor, Celebes, Ternate, Batchian (Coll. Wall.)

ADDENDA ET CORRIGENDA.

Page 307, lines 2 and 13, for 35 read 37; and in the Table read as follows:—

Groups of Islands.	Species of <i>Pieridæ</i> .	Peculiar Species.	Percentage of peculiar Species.
Indo-Malayan	58	38	65
Philippines	34	19	56
Papuan	31	20	65

Page 315. In the List of New Species, *dele Thestias dissimilis*.

Page 316, line 23, *dele* "*Pieris athama*, Lucas = *Tachyris celestina*, Boisd. ♀."

Page 317. *Pontia Crookera*. Not in British Collections.

" " *Pontia medusa*. I can find no record of authentic specimens.

Page 327. *Terias celebensis*. Expanse of wings $1\frac{1}{8}$ — $1\frac{7}{8}$ inch (not $1\frac{1}{8}$ inch to $2\frac{1}{8}$ inches).—A. R. W., Nov. 1867.

[illegible]

PIERIS.

- | | |
|----|------------|
| 1. | mesentina |
| 2. | teutonia . |

INDIAN REGION.		AUSTRALIAN REGION.														
		Celebes.		Moluccan Group.							Papuan Islands.		Timor Group.		Australia and Pacific Is.	

AUSTRALIAN REGION.									
		Australia and Pacific Is.				1		1	
		Timor Group.							
		Timor.		1		:		1	
		Flores.		: 1		:		:	
		Lombok.		: 1		:		:	
		Papuan Islands.		N. Guinea and Salwatty.		: : : 1 1		: :	
		Waigiu.		: :		: : :		: :	
		Mysol.		: :		: 1 :		: :	
		Aru Islands.		: :		: 1 :		1 :	
		Moluccan Group.		Ké Isl.		: : : 1 :		: :	
		Goram and Matabello.		: :		: : : :		: :	
		Ceram and Amboina.		: :		: 1 : :		1 :	
		Bouru.		: :		: 1 : :		1 :	
		Morty Isl.		: :		: : : :		1 :	
		Gilolo and Ternate.		: :		: : : :		1 :	
		Kaioa Isl.		: :		: : : :		: :	
		Batchian.		: :		: : : :		1 :	
		Celebes.		Sulla Isl.		: : : :		: :	
		Celebes.		: : 1		: : : :		1 1 :	
INDIAN REGION.									
		Philippines.		1 : : . 1 1		: : : :		1 1 :	
		Indo-Malay Islands.		Borneo.		1 : : : . : : 1		: : : :	
		Java.		: : : 1 . : : .		: : : : 1 1		: : : :	
		Sumatra.		1 : : : . : 1		: : : : 1 :		: : : :	
		Malacca and Singapore.		1 : : : . : 1		: : : : 1 1		: : : :	
		Asia.		Chinese Asia.		: : : : 1 : : .		: : : :	
		Indian Asia.		: 1 : : : . : 1		: : : : : : 1 1		: : : :	
PALEARCTIC REGION.									
TACHYRIS— continued.									
2.	cardena	...							
3.	nerissa	...							
4.	{ lynceola	...							
5.	{ lyncida	...							
6.	{ lycaste	...							
7.	{ formosana	...							
8.	{ andrea	...							
9.	{ hippo	...							
10.	enarete	...							
11.	scyllaria	...							
12.	{ ada	...							
13.	{ clavis	...							
14.	abnormis	...							
15.	{ panda	...							
16.	{ nathalia	...							
17.	{ paulina	...							
18.	Rouxii	...							
19.	psyche	...							
20.	galathea	...							
21.	(Nic. Is.)	...							
22.	{ ega	...							
	{ urania	...							

[illegible]

		AUSTRALIAN REGION.									
		Australia and Pacific Is.		Timor Group.		Papuan Islands.		Moluccan Group.		Celebes.	
				Timor.	1						
				Flores.	:					1	
				Lombok.	:					:	
				N. Guinea and Salwatty.	:					:	
				Waigiou.	:					:	
				Mysol.	:					:	
				Aru Islands.	:					:	
				Ké Isl.	:					:	
				Goram and Matabello.	:					:	
				Ceram and Amboina.	:					:	1
				Bouru.	:					1	:
				Morty Isl.	:					1	:
				Gilolo and Ternate.	:					1	:
				Kaioa Isl.	:					:	:
				Batchian.	:					1	:
				Sulla Isl.	:					:	:
				Celebes.	:					1	:
				Philippines.	:					1	:
				Borneo.	:					1	:
				Java.	:					1	:
				Sumatra.	:	1				1	:
				Malacca and Singapore.	:					1	:
				Chinese Asia.	:	1				:	:
				Indian Asia.	:	1	1	1	1	:	:
				THESTIAS— cont.	:	:	:	:	:	:	:
				4. Vollenhovii ..	:	:	:	:	:	:	:
				5. venatrix	:	:	:	:	:	:	:
				6. marianne	:	:	:	:	:	:	:
				7. pyrene	:	:	:	:	:	:	:
				8. pirenassa	:	:	:	:	:	:	:
				9. Ludekingii ..	:	:	:	:	:	:	:
				IPHIAS.	:	:	:	:	:	:	:
				1. glaucippe	:	:	:	:	:	:	:
				2. borneensis ..	:	:	:	:	:	:	:
				3. Vossii	:	:	:	:	:	:	:
				4. sulphurea	:	:	:	:	:	:	:
				5. leucogynia ..	:	:	:	:	:	:	:
				6. leucippe	:	:	:	:	:	:	:
				DERCAS.	:	:	:	:	:	:	:
				1. gobrias	:	:	:	:	:	:	:
				2. Verhuelii ..	:	:	:	:	:	:	:
				3. Wallichii	:	:	:	:	:	:	:
				PALÆARCTIC REGION.	:	:	:	:	:	:	:

[illegible]

	PALÆ- ARCTIC REGION.	INDIAN REGION.			AUSTRALIAN REGION.				
		Asia.	Malay Is.	Philip- pine Is.	Celebes.	Mo- luccas.	Papua.	Timor group.	Aus- tralia.
PONTIA	3	1	1	2	..	..	1	1
ELODINA.....	1	3	2	1	4
TERIAS	13	8	5	7	8	5	3	9
PIERIS.....	1	21	8	3	4	4	3	6	5
THYCA.....	..	9	13	5	2	13	8	1	7
TACHYRIS	12	12	14	9	10	8	3	7
PRIONERIS	5	4						
ERONIA	3	1	2	1	1	1	1	
CALLOSUNE..	..	3							
COLIAS	5	8	..	..	..	..	..	..	1
IDMAIS	5							
THESTIAS	4	3	..	..	..	..	2	
IPHIAS	1	3	1	1	3	..	1	
DERCAS	2	1						
GONEPTERYX	..	3							
CALLIDRYAS.	..	6	4	3	3	4	4	7	4
Total Species.	6	98	58	34	30	46	31	26	38
		157			139				

Thus, of the 279 species enumerated in this Catalogue, 157 have occurred in the Indian region, 139 in the Australian region, and six only of the 279 have been found in the Palæarctic region; but more accurate knowledge of the border districts will probably much increase this last number.

EXPLANATION OF THE PLATES.

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4a ♂.					
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5a ♂.					

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4 ♂.					
4 ♀.					

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6a ♀.					

PLATE IX.

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